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Section 1 - Introduction

Urban Water Management Planning Act

Water Code Section 10620 (a) of the Urban Water Management Act, states "Every urban water supplier shall prepare and adopt an urban water management plan in the manner set fourth in Article 3 (commencing with section 10640). These plans are to be updated every five years and submitted to the Department of Water Resources (DWR). Urban water management plans for 2005 are due to DWR on December 31, 2005.

Requirement for the urban water management plans include:

- Assessment of current and projected water supplies
- Evaluation of Demand and Customer Types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan for in the event of water shortage
- Comparison of demand and supply projections.

This report has been prepared to comply with the Urban Water Planning Act. In addition to meeting the requirements of the Act, this report will be used to support water supply assessment and verification required by Senate Bills 610 and 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size prior to project approval. Both bills allow an Urban Water Management Plan to be used as a source document that may be used to fulfill these legislative requirements.

Public Participation

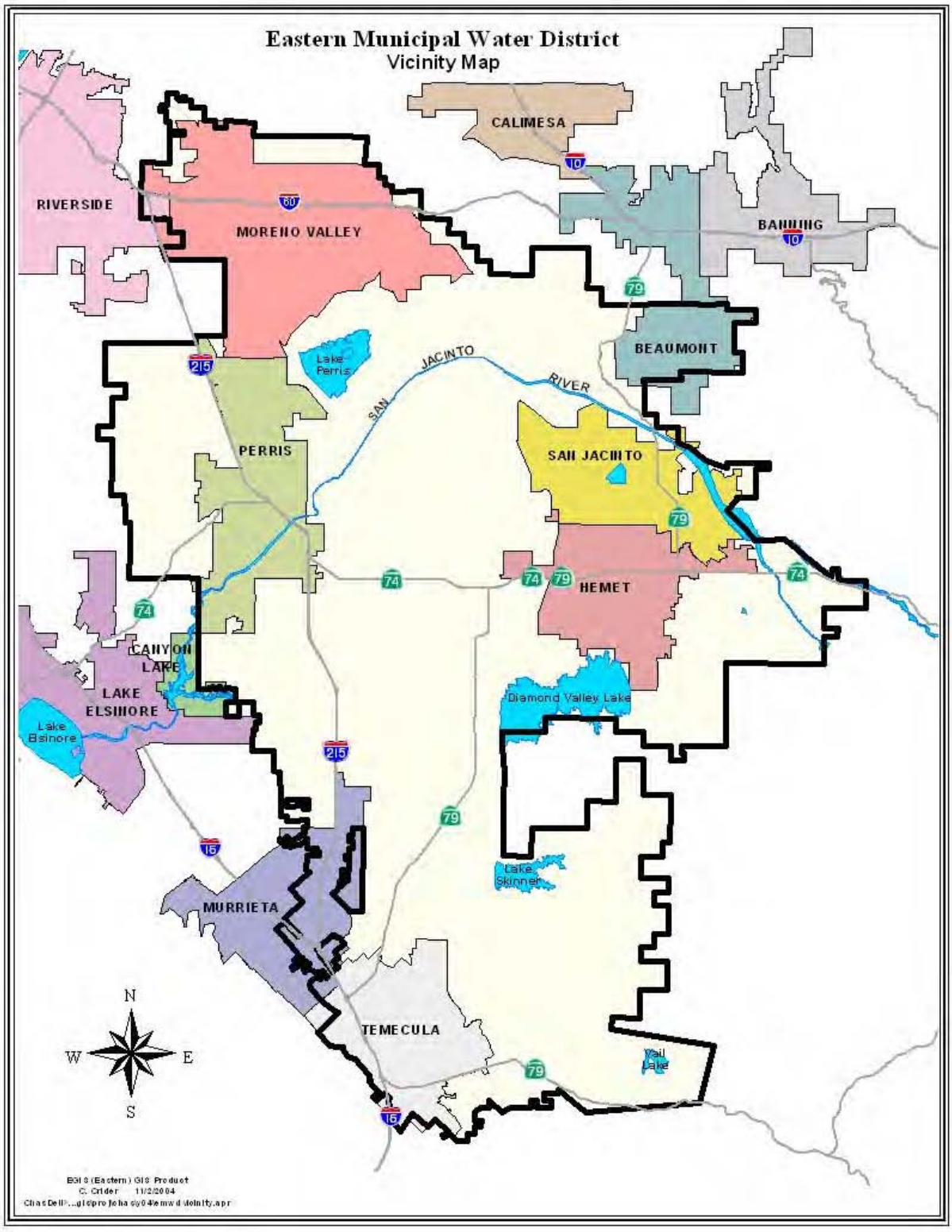
Article 3, Section 10642 of the Urban Water Management Plan Act requires that each urban water supplier shall encourage the active involvement of diverse social, cultural and economic elements of the population within the service area. EMWD has encouraged the participation of sub agencies, cities and the County of Riverside and other public groups. Public participation and coordination efforts are detailed in Appendix A.

Eastern Municipal Water District

Eastern Municipal Water District (EMWD, District) is a public water agency formed in 1950 by popular vote. In 1951, it was annexed into the Metropolitan Water District of Southern California (MWD) and gained a supply of imported water from the Colorado River Aqueduct (CRA). Today, EMWD remains one of MWD's twenty-six member agencies and receives water from Northern California through the State Water Project (SWP) in addition to its deliveries through the CRA.

EMWD's initial mission was to deliver imported water to supplement local groundwater for a small, mostly agricultural, community. Over time, EMWD has evolved to include groundwater production, desalination, water filtration, wastewater collection and treatment, and regional water recycling to the list of products and services it offers to its over 100,000 customers. Located in one of the most rapidly growing regions in the

Figure 1.1 Areas Within EMWD Boundaries



Nation, EMWD has a mission "to provide safe and reliable water and wastewater management services to our community in an economical, efficient, and responsible manner, now and in the future."

A five-member Board of Directors governs EMWD. Each director serves an area of equivalent population size within EMWD's boundaries and is elected to office every four years. As a member agency of MWD, EMWD also has a board member appointed to the MWD Board of Directors.

EMWD is located in western Riverside County, approximately 75 miles east of Los Angeles. The 555 square mile service area includes six incorporated cities in addition to the unincorporated areas of the County of Riverside.

The areas within EMWD's boundary are:

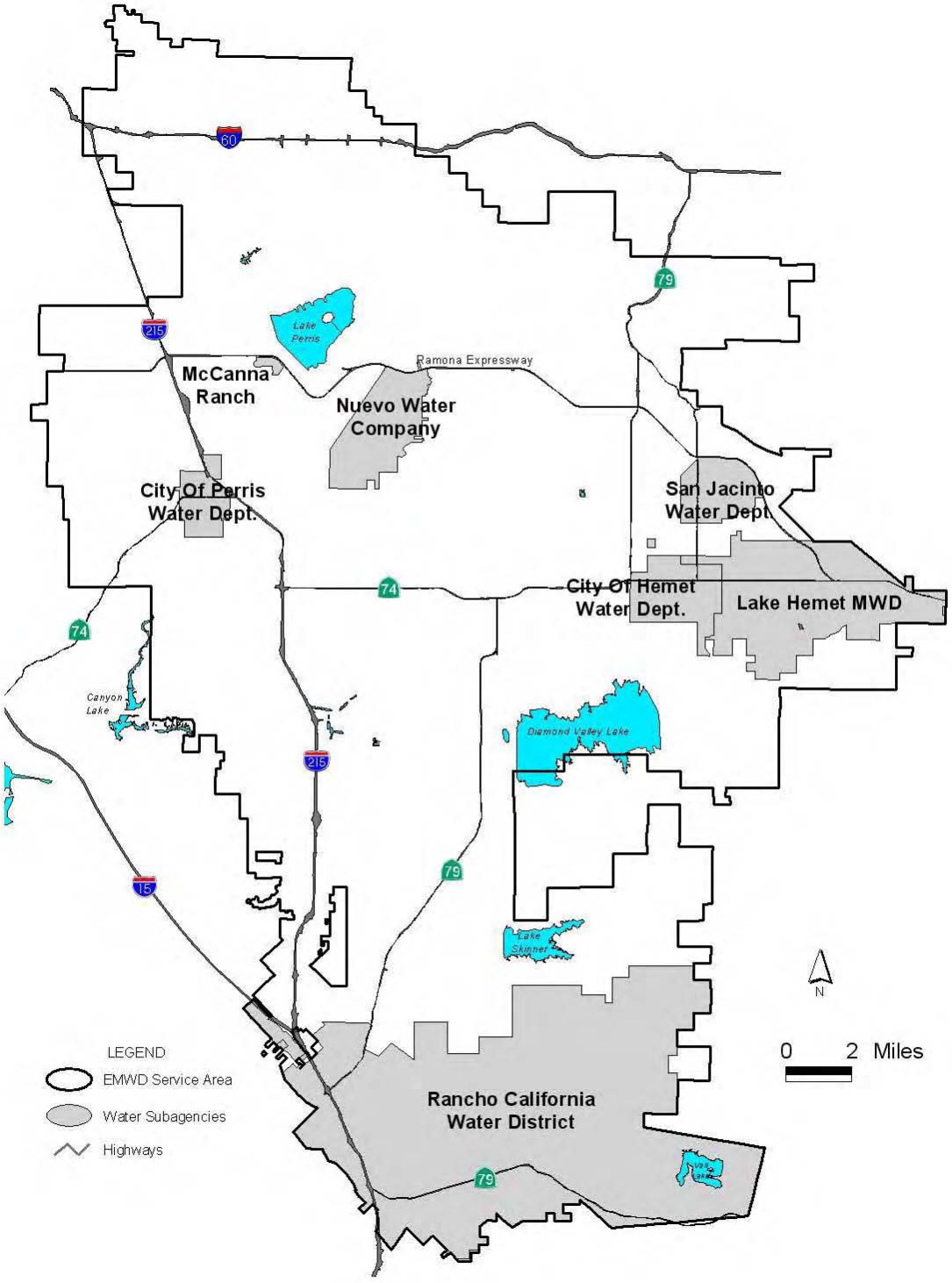
City of Hemet
City of Moreno Valley
City of Murrieta
City of Perris
City of San Jacinto
City of Temecula
Homeland
Lakeview
Murrieta Hot Springs
Nuevo
Quail Valley
Romoland
Sun City
Valle Vista
Winchester

In most of the listed areas, EMWD provides both water and sewer service. However in some places, EMWD provides only sewer or water service, or provides wholesale water to a sub agency.

EMWD is a wholesale provider to the following sub agencies:

City of Hemet Water Department
City of Perris Water Department
City of San Jacinto Water Department
Lake Hemet Municipal Water District (LHMWD)
McCanna Ranch Water Company
Nuevo Water Company
Rancho California Water District (RCWD)

Figure 1.2 - EMWD Sub Agencies



Several of these agencies have or will prepare their own Urban Water Management Plan (UWMP). With the exception of RCWD and McCanna Ranch Water Company, EMWD has discussed and reviewed the supplemental water demand required by each agency

with representatives of that agency. The demand requirements and water supply are discussed in this plan. RCWD, while an EMWD sub agency, receives water directly from a connection to MWD. RCWD is preparing its own UWMP that will address their water supply issues. RCWD's population, demand and supply is not analyzed nor discussed in this plan. McCanna Ranch Water Agency depends on EMWD for emergency purposes and does not have any annual projected demand. The Murrieta Water Company was a subagency at the beginning of 2005, but merged with Western Municipal Water District in November and is not anticipated to demand water form EMWD after 2005.

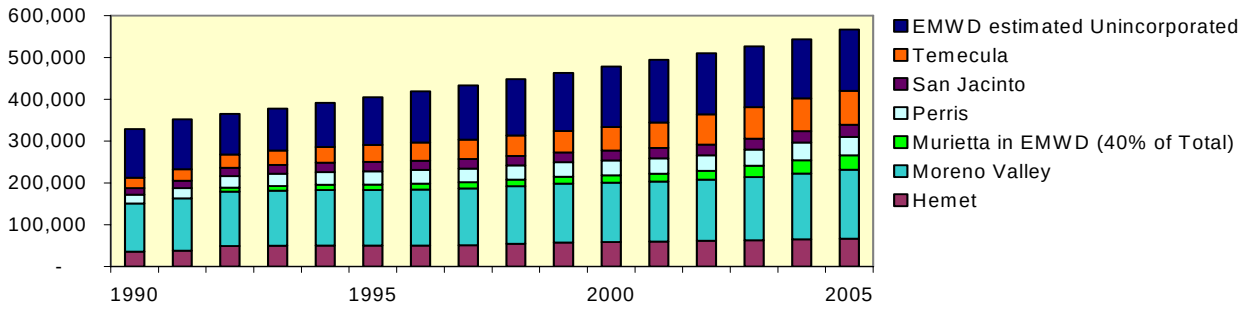
Population

EMWD is located in one of the most rapidly growing regions in the United States. Since 1990, over 230,000 people have been added to the service area of EMWD, nearly doubling the population. Table 1.1 and Figure 1.3 show the estimated population of various EMWD areas from 1990 to 2005. These estimates are taken from the California Department of Finance Report 90-E4, Population Estimated for California State and Counties.

Table 1.1 - Population Within EMWD's Boundary

	1-1-90	1-Apr-90	1-Jan-95	1-Jan-00	1-Jan-05
Population		CENSUS		CENSUS	
Hemet	35,350	36,094	50,100	58,500	66,455
Moreno Valley	115,500	118,779	132,700	142,000	165,328
Murrieta in EMWD (40% of Total)	-	-	13,040	17,540	34,041
Perris	21,050	21,500	32,050	35,900	44,594
San Jacinto	15,500	16,210	22,250	23,400	28,437
Temecula	25,300	27,099	40,850	56,600	81,397
Total EMWD Cities	212,700	219,682	290,990	333,940	420,252
EMWD Estimated Unincorporated	UNK	120,075	114,033	144,716	146,483
Estimated EMWD Total Population	UNK	339,757	405,023	478,656	566,735

Figure 1.3 - Population Growth Within EMWD Boundary Population Projections



Growth Projections

EMWD uses several tools to assist in planning for new development and the new demand for water that comes with them. A database of proposed projects, regional projections, socioeconomic studies and the Riverside County Integrated Plan are all used to develop growth projections.

To track new construction in the District, EMWD developed a Geographic Information Systems (GIS) database of new developments. This database contains information about size, location and status of new projects within EMWD's boundaries. New projects are tracked from the initial planning stage until construction is complete and new meters are installed. This database allows the District to anticipate where new demand for water will be concentrated and estimate when new projects will require water and sewer service. Projects that have engineered design plans in plan check or where construction is initiated are anticipated to impact the District within one to five years. For projects still in the planning stages, anticipating a construction date can be difficult. Planned projects can be delayed or expedited based on the economy, environmental constraints, infrastructure requirements or any number of additional factors.

To insure that planning efforts for future growth are comprehensive, EMWD incorporates regional projections to calculate future growth. Projections from the Southern California Association of Governments (SCAG) 2004 Transportation Plan are used as a guideline to approximate what the long-term growth rates will be for EMWD.

In addition to the new project information collected by EMWD and projections by SCAG, EMWD uses an economic consultant to develop housing projections. In May of 2003, Empire Economics completed a socioeconomic study that resulted in a most probable demand projection for new homes for each of the 1990 Census Tracts in the District. Since EMWD did not have a comprehensive database of new projects in 2003, that study was based largely on SCAG projections published in 2000. In 2004 and 2005, the same consultant returned performing a detailed analysis of growth in several small portions of the District. By doing field studies and economic analysis of the study area, the consultant was able to develop most probable demand projections for new homes within each of 30 sub areas covering much of EMWD's service area.

Using these housing projections, SCAG projections and persons per household data, EMWD has developed its population projection as seen in Table 1.2. The projection provided does not include the population of any portion of the District served water through Rancho California Water District including Temecula.

Table 1.2 - Current and Projected Population

	2005	2010	2015	2020	2025	2030
Service Area Population	493,960	583,050	674,550	759,155	830,020	889,230

Climate

EMWD has a semi-arid climate characterized by hot, dry summers and cooler winters. The average rainfall is between 11 and 12 inches occurring mostly in December through March. The region experiences wide variation in rainfall and periodic local drought. Table 1.3 has a summary of temperature and precipitation for EMWD's service area taken from local climate stations.

Table 1.3 - EMWD Climate

	Jan	Feb	Mar	Apr	May	June
Standard Monthly Average Et^o	2.47	2.65	3.79	5.05	5.78	11.50
Average Rainfall (inches)	2.54	3.16	2	0.68	0.32	0.05
Average Max. Temperature (Fahrenheit)	66.1	38.4	69.6	76.7	82.1	91.9
Average Min. Temperature (Fahrenheit)	36.3	38.7	41.1	44.4	49.6	54

Table 1.3 - EMWD Climate (Continued)

	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average Et^o	6.89	6.68	5.29	4.01	3.01	2.46	54.56
Average Rainfall (inches)	0.03	0.24	0.15	0.25	0.66	1.02	11.09
Average Max. Temperature (Fahrenheit)	97.4	98	92.6	84.2	73.8	67.6	80.7
Average Min. Temperature (Fahrenheit)	58.9	59.4	57.5	39.8	34.5	34.5	46.9

In dry years, potable water demand increases slightly during the months when rainfall usually occurs, but peak demand during hot summer months remains fairly constant. Even in wet years, the demand may decrease during winter months, but still remains high during peak summer months.

The recycled water system, which serves agricultural and landscape demand, is slightly more sensitive to climate fluctuation. In dry years, there may be a small increase in demand during typically wet months to make up for the lack of rainfall, but summer's demand remains consistent. Wet years actually cause greater concern than dry years for the operation of the recycled water system. Excessive rainfall reduces the demand of customers during the rainy season and increases the supply of recycled water. This forces EMWD to find other means of disposing excess recycled water.

Other Demographic Factors

As the population within EMWD continues to grow, the characteristics of the service area are continually changing. District-wide, tract homes, commercial centers and new industrial warehouses are replacing acres of agriculture and open space. The average household size is becoming smaller and the medium income is increasing. Over the next 25 years, EMWD's population is projected to grow by over 400,000 people, nearly doubling its current population.

The area has a history of rapid growth followed by major declines in the housing market. From the mid-1980's to 1990, population growth in EMWD routinely exceeded 10% per year. In the early 1990's, growth slowed during an economic recession. During the late 1990's, growth began to steadily increase, and the first five years of the 2000's brought accelerated growth in the housing market. This growth has challenged EMWD to develop new sources of supply and construct new facilities and infrastructure to bring water to hundreds of new customers each month.

Some indicators suggest that growth within EMWD's service area may have reached its peak rate in 2004, but others suggest that 2005 may see just as much growth as the past year. However, what is certain is that EMWD is still a growing water agency. Ultimate demand estimates indicate that before EMWD reaches build out, the population

will nearly triple its current size. Land will continue to be developed in western Riverside County as more and more people are added. Just as it has in the past, EMWD will continue to meet the challenges of new development with innovation, efficiency and responsibility.

Section 2 – Water Sources

EMWD has three sources of water supply: imported water from MWD, local groundwater production, and recycled water. Water sources can be divided into two types - potable and non-potable. Sources of potable water supply, suitable for all uses including human consumption, include:

- Groundwater within the San Jacinto Watershed
- Desalination plants that treat groundwater with a high salt content through reverse osmosis until it is acceptable for drinking
- Microfiltraion plants owned and operated by EMWD, filtered water from the Colorado River or State Water Project (SWP) through membranes to remove particulate contaminants to potable water standards
- The Henry J. Mills Filtration Plant (Mills), owned and operated by MWD, which treats water from northern California and provides it for sub agency purchase
- The Robert F. Skinner Filtration Plant (Skinner), owned and operated by MWD. This plant treats a blend of Colorado River Water (CRW) and water from northern California for potable use.

See Table 2.1 for the amount of potable water projected to be supplied by each source for 2005 to 2030.

In addition to potable water supplies, EMWD has several sources that supply water that may not be suitable for drinking but can be used for agriculture, landscape irrigation and industrial processes. These sources include:

- Recharge water from MWD. This untreated water from MWD is percolated into the ground through the soil, adding water to the aquifer below. EMWD and others can extract this water at a later date for beneficial uses.
- Untreated water from MWD for agricultural purposes. Water imported from MWD does not often need additional filtration to be used to irrigate crops.
- Recycled water. This highly treated wastewater can be used for many purposes including agriculture, landscape irrigation, and industrial use.

The projected amount of non-potable water supplied by each source from 2005 to 2030 is summarized in Table 2.2.

The location of each potable water source can be seen in Figure 2.1. Groundwater is the major supply of water in the Hemet/San Jacinto area portion of EMWD. This area includes the Cities of both Hemet and San Jacinto as well as surrounding unincorporated areas. The desalination plant serves the middle portion of the District including Menifee, Sun City, north Canyon Lake and Quail Valley. The micro filtration plant in Perris currently serves Perris, Romoland, Lakeview and Nuevo. The Hemet Micro filtration Plant will supplement supply to the Hemet/San Jacinto area. Mills serves Moreno Valley, Menifee, Perris, Sun City, Good Hope, Mead Valley, Lakeview, Nuevo, Romoland, north Canyon Lake, and Quail Valley, while Skinner in the southeast, serves Murrieta, Murrieta Hot Springs, and, occasionally, Menifee, and southern Sun City. In times of peak demand, Skinner is also available to serve demand in the Hemet/San Jacinto area. The limits of services for each source of supply often vary due to demand level and operation procedures and constraints.

Table 2.1 - Potable Water Supply by Source (AFY)

	2005	2010	2015	2020	2025	2030
EMWD Groundwater Production in the San Jacinto Basin						
West San Jacinto Area	6,000	6,000	6,000	6,000	6,000	6,000
Hemet/San Jacinto Basin Area – Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Hemet/San Jacinto Recovery of Recharged Groundwater		5,600	6,600	6,400	6,200	6,200
EMWD Groundwater Desalination Program in the San Jacinto Basin						
Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Perris	2,000	4,500	4,500	4,500	4,500	4,500
Perris II		-	4,500	4,500	4,500	4,500
EMWD Micro-filtration Plants (MWD Full Service Untreated EM –4 & 14)						
Perris FP	8,000	10,900	16,000	16,000	16,000	16,000
Hemet FP		5,400	8,000	8,000	8,000	8,000
MWD Full Service Treated Water Deliveries (EM 12 & 17)						
Mills	55,900	58,600	62,200	76,700	86,800	94,800
Skinner	18,000	14,000	16,000	18,000	20,000	22,000
Total	103,500	115,200	134,000	150,300	162,200	172,000

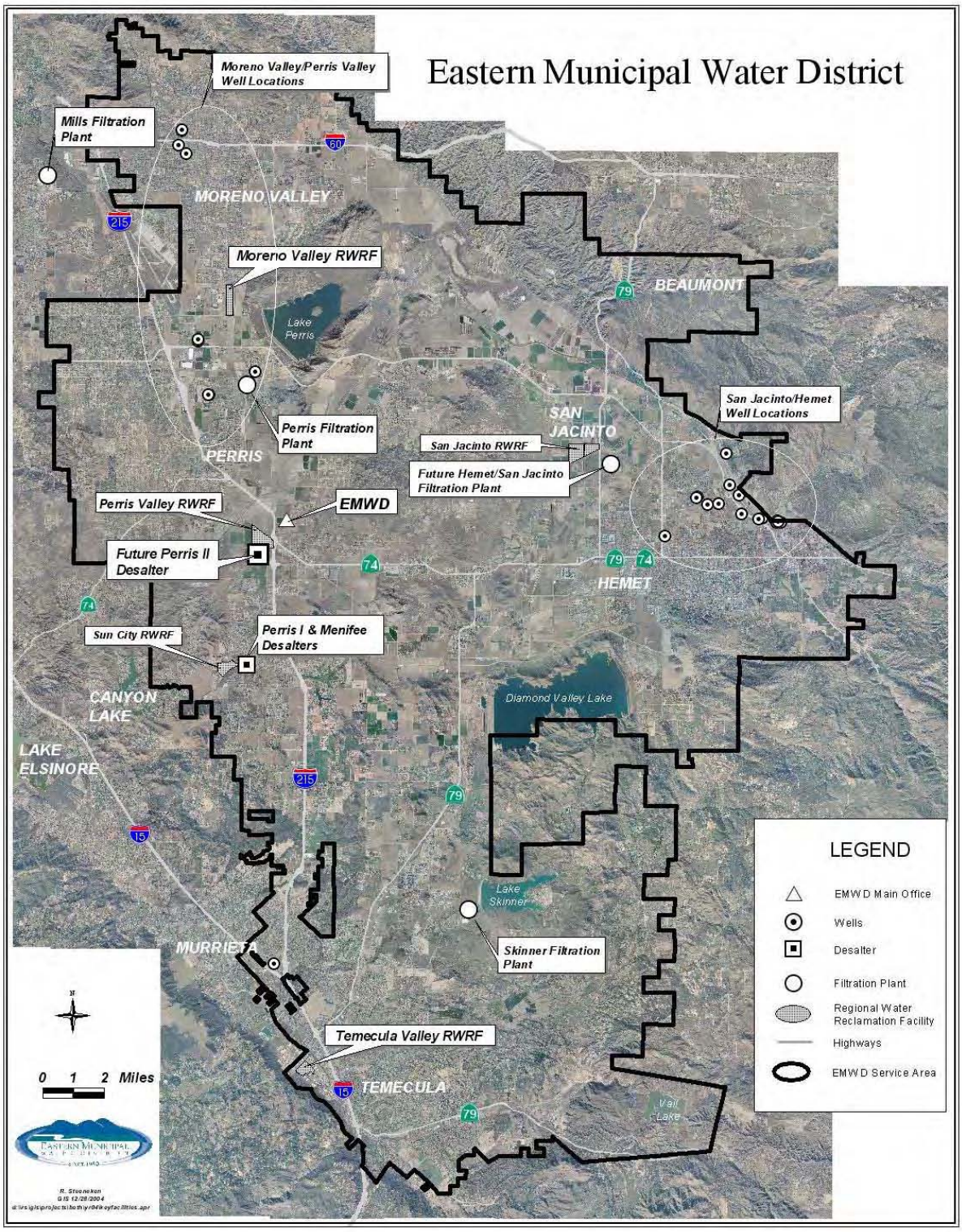
Table 2.2 - Non-Potable Water Supply by Source (AFY)

	2005	2010	2015	2020	2025	2030
Groundwater Recharge (MWD Untreated EM-14)						
Recharge Water into the San Jacinto Basin	8,000	20,000	22,200	22,600	22,600	22,500
MWD Untreated Agricultural Water Deliveries (EM 14)						
MWD Untreated AG	2,500	1,200	2,100	2,600	3,100	3,500
Recycled Water						
Recycled M&I Use	3,500	7,700	10,950	13,300	15,750	17,500
Industrial Enterprise & Aesthetic Improvement	0	7,000	8,250	9,500	10,750	12,000
Recycled Water – Agricultural Use/Wildlife Habitat	21,500	17,700	17,500	17,500	17,500	17,500
RW Total	25,000	32,400	36,700	40,300	44,000	47,000
Total	35,500	53,600	61,000	65,500	69,700	73,000

Table 2.3 - Total Water Supply (AFY)

	2005	2010	2015	2020	2025	2030
Total	139,000	168,800	195,000	215,800	231,900	245,200

Figure 2.1 - Location of Supply Sources



Imported Water

EMWD relies on MWD for 80% of its potable water supply. Treated water ready for potable use is supplied from two sources through separate MWD water treatment facilities. The two sources of water are the SWP and the Colorado River. The two water treatment facilities are Mills and Skinner.

The SWP is California's state-built water and power development and conveyance system. It includes pumping and power plants; reservoirs, lakes, and storage tanks; and canals, tunnels, and pipelines—that capture, store, and convey water from northern California to southern California. Water from the Colorado River is delivered into MWD's service area via the Colorado River Aqueduct (CRA). The water treated at Mills is SWP water and the water treated at Lake Skinner is a blend of Colorado River water and SWP water.

In addition to treated water, EMWD utilizes untreated or non-potable water imported from MWD. This water needs purification and further treatment before it is available for potable use. This water is imported by MWD through the SWP pipeline running through EMWD's service area. Currently, EMWD treats raw water at a single microfiltration plant in Perris. That plant currently has an expansion under construction. In Hemet, construction has begun on another microfiltration plant to add a supply source in that portion of EMWD. These small micro filtration plants allow EMWD to meet the needs of local customers when MWD's treated water resource may be stretched to their limit, especially during peak summer months. Raw water from MWD is also used for agricultural customers and for recharging the groundwater basins EMWD and others rely on.

Groundwater

In an effort to reduce dependency on imported water supplied by MWD, EMWD has developed several programs designed to take advantage of local resources. High-quality groundwater has long been a source of water supply for local customers in the Hemet/San Jacinto area. In Perris, groundwater is blended with imported water for use in the western portion of EMWD. Protecting and developing local groundwater resources to reduce dependency on imported water, is an important objective in EMWD's Strategic Plan.

EMWD's service area encompasses all or part of two different watersheds. The southern portion of the District is tributary to the Santa Margarita River Watershed. The use of all surface and sub-surface waters within the watershed of the Santa Margarita River is under the jurisdiction of the United States District Court for the Southern District of California. The court appointed a Watermaster and Steering Committee to provide recommendations to the court regarding the watershed. EMWD is represented on the Steering Committee. Currently, EMWD does not produce any groundwater in the Santa Margarita Watershed and there are no plans to do so in the future.

The northern part of EMWD's service area covers the San Jacinto Watershed. To the west, the West San Jacinto Groundwater Management Plan was adopted in 1995 under the auspices of Assembly Bill 3030 now codified in the California Water Code. Annual reports on the status of groundwater and water resources efforts in the area have been published since 1996. To the east, the Hemet/San Jacinto Water Management plan is in process. EMWD is working with other agencies, the cities, and private groundwater

producers in the area to develop and implement a management plan that should be complete and adopted in the coming year. The first annual report for the Hemet/San Jacinto Water Management Plan area was published in June 2005. The groundwater EMWD produces and is considered in this Urban Water Management Plan, is pumped from the San Jacinto Watershed.

Part of the plan being developed for the Hemet/San Jacinto Groundwater Management area will expand the current use of raw or untreated water from MWD to recharge portions of the San Jacinto basin. In 2004 and 2005, EMWD, LHMWD and the Cities of Hemet and San Jacinto addressed deteriorating groundwater levels in the area and reduced the historical impact of overdraft caused by past groundwater production by implementing a cooperative groundwater recharge program. In 2004, 6,000 AF of SWP water was recharged at two existing recharge pond sites in the San Jacinto riverbed and, for 2005, the recharge goal is 8,000 AF. EMWD is now developing the Hemet/San Jacinto Recharge and Recovery Program – a groundwater replenishment and recovery program that will be implemented in two phases. The first phase will entail construction of six recharge basins in the San Jacinto riverbed. Phase II involves nine additional recharge basins and a 7.7 mile pipeline. Both phases include construction of recovery or extraction wells as well as monitoring wells. This regional effort, funded partially by a $5 million grant from the California Department of Water Resources, is expected to cost $13.7 million and will protect and optimize the use of local resources.

EMWD constructed the Menifee Desalter to recover and treat high total dissolved solids (TDS) groundwater and manages the salinity in the West San Jacinto Groundwater Basin Management Plan area. This facility treats high TDS groundwater from the Menifee and south Perris areas and produced 1,441 AF of potable water in 2004. Construction of a second desalter, the Perris I Desalter next to the Menifee Desalter is complete and the new plant will expand the capacity of desalinated water production from 3 to 7 MGD. Test wells are being drilled for a third desalter, and an iron and manganese removal facility, initiated in 2004, will be constructed at the Sun City Regional Water Reclamation Facility next to the existing and planned desalters.

Recycled Water

In addition to groundwater and imported water, EMWD is dedicated to expanding and maximizing the use of recycled water produced at four regional water reclamation facilities. Demographic changes in EMWD's service area are increasing the amount of recycled water available while reducing the traditional demand by agricultural customers. This has challenged EMWD to improve reliability and provide recycled water to a growing market of commercial, industrial and institutional customers.

Section 3 - Groundwater

EMWD's only locally produced potable water is the groundwater extracted from the basins below the San Jacinto Watershed. This water accounts for approximately 20% of EMWD's supply and with the use of new technology and in partnership with others in the region; EMWD is working to ensure the quality and reliability of the basins for now and into the future.

Basin Description

San Jacinto Watershed - Groundwater Management Zones in EMWD's Service Area

The San Jacinto Watershed covers an area of approximately 728 square miles, measured above a point just downstream from Railroad Canyon Dam. All of the streams and rivers in the watershed are ephemeral; they flow only when precipitation occurs and much of this flow infiltrates to groundwater. When storms are unusually intense and prolonged, the ground saturates quickly and most of the precipitation runs off to streams. The San Jacinto River rises in and drains the western slopes of the San Jacinto Mountains. Waterways tributary to the river include the North and South Forks, Strawberry, Indian, Poppet, and Bautista Creeks. The river recharges the groundwater basin in the area southeast of the City of San Jacinto. It then flows northwest past the Lakeview Mountains before turning southwest to flow across the Perris Valley floor. The San Jacinto River ultimately flows into Lake Elsinore via Railroad Canyon and Canyon Lake. Lake Elsinore, when full, overflows into Temescal Wash, which joins the Santa Ana River near Prado Dam.

The San Jacinto groundwater basin lies within alluvium-filled valleys carved into the elevated bedrock plateau of the Perris Block. Collectively, the basins are nearly surrounded by impermeable bedrock mountains and hills. Internally, island-like masses of granite and metamorphic bedrock rise above the valley floor.

The San Jacinto and Casa Loma fault zones are the major geologic features that bound and/or crosscut many of the groundwater basins, and typically are effective barriers to groundwater flow. The area between the San Jacinto and Casa Loma faults is a deep, alluvium-filled graben of tectonic origin, commonly referred to as the San Jacinto Graben. The effective base of freshwater in the graben is known to be quite deep but has not been precisely determined. The San Jacinto Graben consists of a fore bay area in the southeast where surface water recharge primarily occurs and a pressure area in the northwest where deep aquifers exist under confined conditions. To the east, the San Jacinto mountain range is the dominant geographic feature of the region, rising to a height of 10,805 feet.

Groundwater management zones were delineated based on major impermeable boundaries, constrictions in impermeable bedrock, groundwater divides, and internal flow systems. The eight-groundwater management zones in the San Jacinto Watershed within EMWD's service area are:

1. Canyon
2. San Jacinto Upper Pressure
3. San Jacinto Lower Pressure
4. Lakeview/Hemet North
5. Hemet South

6. Perris South
7. Perris North
8. Menifee

Canyon Management Zone - The Canyon, San Jacinto Upper Pressure, and San Jacinto Lower Pressure Management Zones lie along a northwest to southeast axis in the northern part of the San Jacinto Valley. The boundaries of the Canyon Management Zone include the San Jacinto Mountains to the east and the San Jacinto fault to the west. The San Jacinto Mountains are composed of consolidated crystalline bedrock and semi-consolidated sedimentary rocks. These rocks are virtually impermeable and bound the water-bearing, alluvium-filled canyons within this management zone.

San Jacinto Upper Pressure Management Zone - The San Jacinto Upper Pressure Management Zone is bounded by the San Jacinto fault to the northeast, the Casa Loma and Bautista Creek fault zones to the southwest, and the flow system boundary with the San Jacinto Lower Pressure Management Zone to the northwest. The San Jacinto fault is a known barrier to groundwater flow, and separates the San Jacinto Graben from the San Timoteo Badlands and the San Jacinto Mountains. East of the City of San Jacinto, a branch of the San Jacinto fault zone cuts the alluvial fill by extending southeast across the San Jacinto River and along the channel of Bautista Creek until it intersects the Park Hill fault. This branch of the San Jacinto fault zone separates the San Jacinto Upper Pressure Management Zone from the Canyon Management Zone.

A branch of the San Jacinto fault zone extends southeast along the channel of Bautista Creek until it intersects the Park Hill fault. In the early 1900s, the barrier effect of the fault resulted in rising groundwater within the San Jacinto River upstream of the fault. This area is known as the Cienega and is an area of significant municipal groundwater production. The Casa Loma and Bautista Creek fault zones are known barriers to groundwater flow. However, groundwater leaks across the fault zones as underflow to the Hemet South and Lakeview/Hemet North Management Zones.

San Jacinto Lower Pressure Management Zone - Boundaries of the San Jacinto Lower Pressure Management Zone include the San Jacinto fault to the northeast; the Casa Loma fault and its northwestward extension; various crystalline bedrock outcrops to the north and west; and the flow system boundary with the San Jacinto Upper Pressure Management Zone to the southeast.

Lakeview/Hemet North Management Zone - Boundaries of the Lakeview/Hemet North Management Zone include the Casa Loma fault zone to the east; the groundwater divide near Esplanade Avenue to the south; the Lakeview Mountains to the west and south; the Bernasconi Hills to the north; and a bedrock constriction/saddle to the west. The Casa Loma fault zone is a known barrier to groundwater flow. However, groundwater leaks across the fault zone as underflow from the Upper San Jacinto Management Zone. Impermeable, crystalline bedrock outcrops that compose the Bernasconi Hills and the Lakeview Mountains to the north and south, respectively, are hard rock barriers to groundwater flow. To the west, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview/Hemet North Management Zones.

Hemet South Management Zone - The boundaries include the Casa Loma and Bautista Creek fault zones to the east; the groundwater divide near Esplanade Avenue

to the north; the groundwater divide in the Winchester area to the west; and various crystalline bedrock outcrops to the south. The Casa Loma and Bautista Creek fault zones are known barriers to groundwater. However, groundwater leaks across the fault zones as underflow from the San Jacinto Upper Pressure Management Zone.

Perris South Management Zone - Boundaries of the Perris South Management Zone include a groundwater divide in the Winchester area; bedrock constrictions/saddles bordering the Menifee Management Zone; a bedrock constriction/saddle bordering the Lakeview/Hemet North Management Zone; a bedrock constriction bordering the Perris North Management Zone; and the surrounding bedrock mountains and hills. A groundwater high exists in the Winchester area near Highway 79. The divide is likely an artifact of natural and artificial recharge and groundwater production patterns. As such, the position (or the very existence) of this groundwater divide may vary with changing artificial recharge and/or production patterns.

Southwest of EMWD's Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Management Zone; this is especially true during times of high groundwater levels. Southeast of Sun City, a similar narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium also is a boundary between the Perris South and Menifee Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Management Zone.

To the northeast, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview Management Zones. Under original flow conditions, groundwater flowed westward from Lakeview into Perris South. However, groundwater now flows from Perris South eastward into Lakeview toward a “pumping depression” in the groundwater table.

Perris North Management Zone - North of the San Jacinto River in the Perris area, the gap between the Bernasconi Hills and the bedrock hills to the west narrows. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and the Perris North Management Zones.

Impermeable, crystalline bedrock outcrops that compose the surrounding mountains and hills are hard rock barriers to groundwater flow.

Menifee Management Zone - Boundaries of the Menifee Management Zone include the bedrock constrictions/saddles bordering the Perris South Management Zone, a bedrock constriction to the east, and the surrounding bedrock mountains and hills. Southwest of the Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Management Zone, especially during times of high groundwater levels.

Southeast of Sun City, a similar narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium also is a boundary between the Perris South and Menifee Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Management Zone.

Groundwater Management

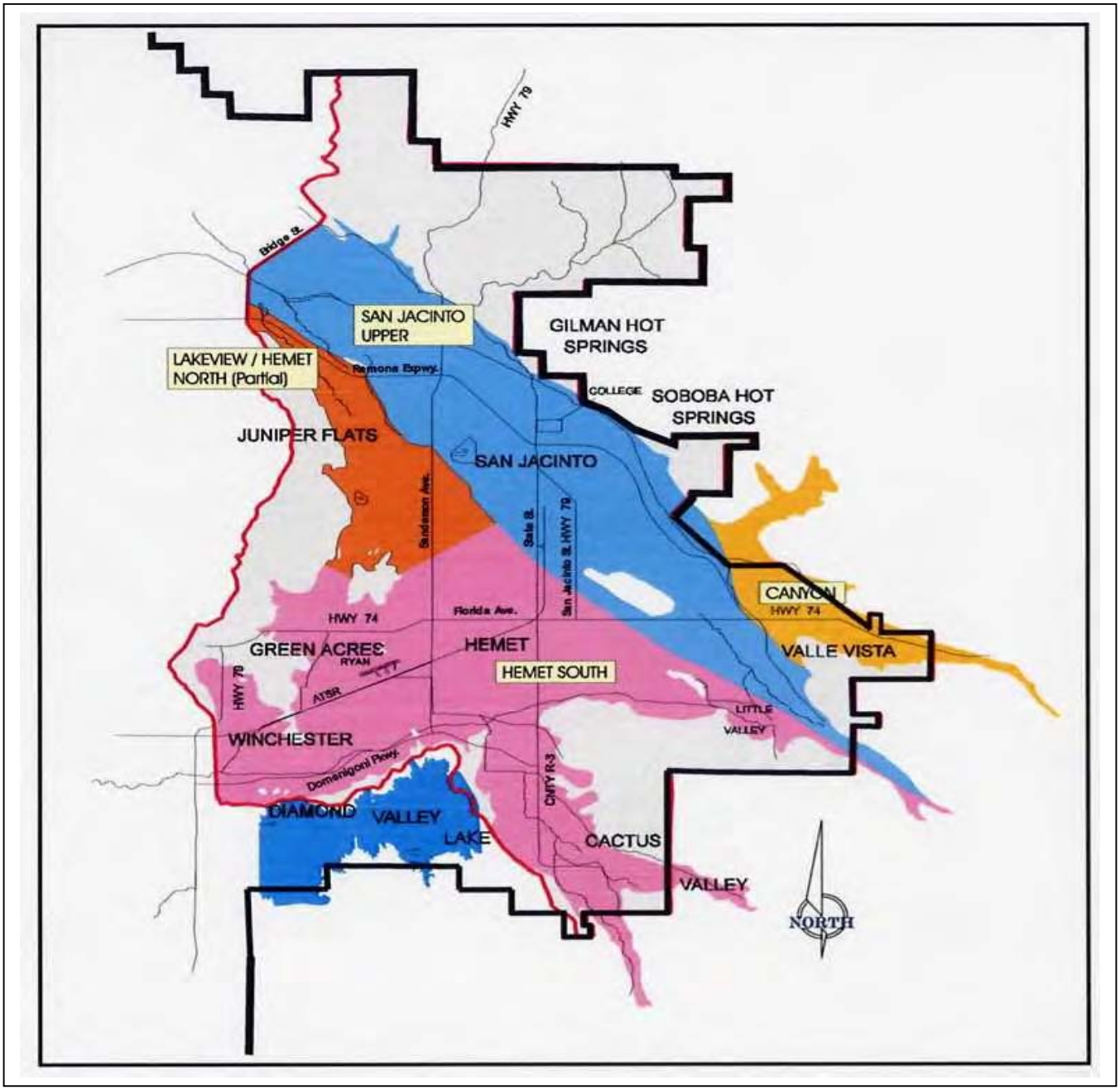
EMWD extracts groundwater from multiple management zones in the San Jacinto Watershed. These zones are covered by one of two groundwater management plans. The Hemet South, Canyon, San Jacinto Upper Pressure, and the Hemet North part of the Lakeview/Hemet North Management Zones are covered by the Hemet/San Jacinto Water Management Plan. This plan is currently being developed and should be finalized in 2005 or early 2006. The Perris North, Perris South, San Jacinto Lower Pressure, and Menifee Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone are covered by the West San Jacinto Groundwater Basin Management Plan. That Plan has been in place since 1995 and a copy is attached as Appendix B.

Hemet/San Jacinto Water Management Area

History of the Hemet/San Jacinto Basin Water Management Plan

Developing and implementing comprehensive water resources management programs to protect, optimize, and enhance the use of all available resources is a strategic goal at EMWD. Groundwater levels in the Hemet and San Jacinto sub-basins steadily declined during a 40-year span from the early 1940's to the end of the 1970's. The 1987-1992 drought quickly followed with similar impact. Recent years with below average rainfall and increased groundwater production have caused water levels to continue to decline. Therefore, groundwater resources need to be responsibly managed and protected. EMWD and local municipal and private groundwater producers are working together to develop and implement a groundwater management plan for the eastern portion of the Hemet/San Jacinto area.

Figure 3.1 - Hemet/San Jacinto Water Management Area



In 1995, the Soboba Band of Luiseno Indians (Tribe) entered into negotiations with EMWD and the Lake Hemet Municipal Water District (LHMWD) to settle groundwater claims. In 2000, the Tribe filed a lawsuit against MWD alleging MWD interfered with Tribal water rights when it constructed the San Jacinto Tunnel along the Colorado River Aqueduct. Since then, negotiations and numerous discussions have lead to the development of the Principles of Settlement. One of the main provisions of the Principles of Settlement is the development of a groundwater management plan.

In June of 2001, the Department of Water Resources (DWR) and local agencies executed a Memorandum of Understanding (MOU) to formulate a groundwater management plan for the Hemet/San Jacinto area. A groundwater policy committee was formed with elected officials from the Cities of Hemet and San Jacinto, LHMWD, EMWD and representatives of private groundwater producers. DWR acts as an impartial mediator to the policy committee. Since it was formed, the policy committee has discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment, export of groundwater from the basins, and how to maximize the use of reclaimed water. It has formed a technical committee to provide guidance and has participated in public outreach meant to share information and encourage cooperation.

In September of 2003, an agreement was made between EMWD, LHMWD and the cities of Hemet and San Jacinto to develop a groundwater monitoring program. Under this agreement monitoring began in 2004, and the first report was published in June of 2005. EMWD, LHMWD and the Cities of Hemet and San Jacinto are all participating in the funding and implementation of the monitoring program. Once the groundwater management plan is in place, future annual reports will be submitted to the Watermaster.

EMWD, LHMWD and the Cities of Hemet and San Jacinto also agreed on the Interim Principles of Groundwater Management in 2003 and then the Principles of Groundwater Management in February 2004. These principles establish the framework for a Water Management Plan for the Hemet/San Jacinto area.

There were two additional MOU's in 2004. The first addressed the deteriorating situation in the sub-basins by providing interim stabilization through recharge and was executed in April. The second, executed in June, describes the funding mechanism for developing the groundwater management plan.

Successful implementation of the Hemet/San Jacinto Water Management Plan will help insure that:

- The Hemet/ San Jacinto area will have a reliable and adequate source of future water supply.
- The settlement claims by the Soboba Band of Luiseno Indians are facilitated and accommodated.
- Existing water production and water services system will be expanded to meet future urban growth.
- Water quality in the management plan area will be protected and/or enhanced.
- Cost-effective water supplies and treatment by the public agencies is supported.
- Groundwater overdraft is eliminated and basin yield enhanced.
- A monitoring program is implemented to promote and provide for best management and engineering principles to protect water resources.

The final Water Management Plan will be a part of a Stipulated Judgment that should be approved by the courts in 2005 or early 2006. The plan should be finalized and implemented in 2006. It will limit the amount of water being extracted from the basin to a sustainable yield and implement continued recharge of the basin using imported water. The Cooperative Agreements for the Water Management Plan are available in Appendix G of this plan.

Water Quality

In 2007, 137 wells were sampled for water quality. One hundred and eleven of the wells were sampled by EMWD while others sampled 26 wells and reported the results to EMWD. In general, the best quality of water occurs in the Canyon Management Zone in the Cienega area and along the river. There is significant municipal production there. Table 3.1 shows the high and low TDS and NO_3 –N concentrations for each management zone. Water quality can be effected by mineral content of sediments, recharge and drainage patterns, historic land use factors, screening intervals and depth of wells sampled and other factors. Water quality monitoring will continue as part of the water management plan and results will be submitted to the Watermaster.

Table 3.1 - TDS and NO_3 –N by Management Zone for 2004

Management Zone	No. of Wells	TDS (mg/L)		NO_3 –N (mg/L)	
		High	Low	High	Low
Canyon	19	1,410	210	10.0	<0.1
S.J.U.P.	66	1,500	200	25.0	<0.1
Hemet North	25	1,010	360	5.4	<0.1
Hemet South	27	1,490	220	30.0	0.6
Total	137				

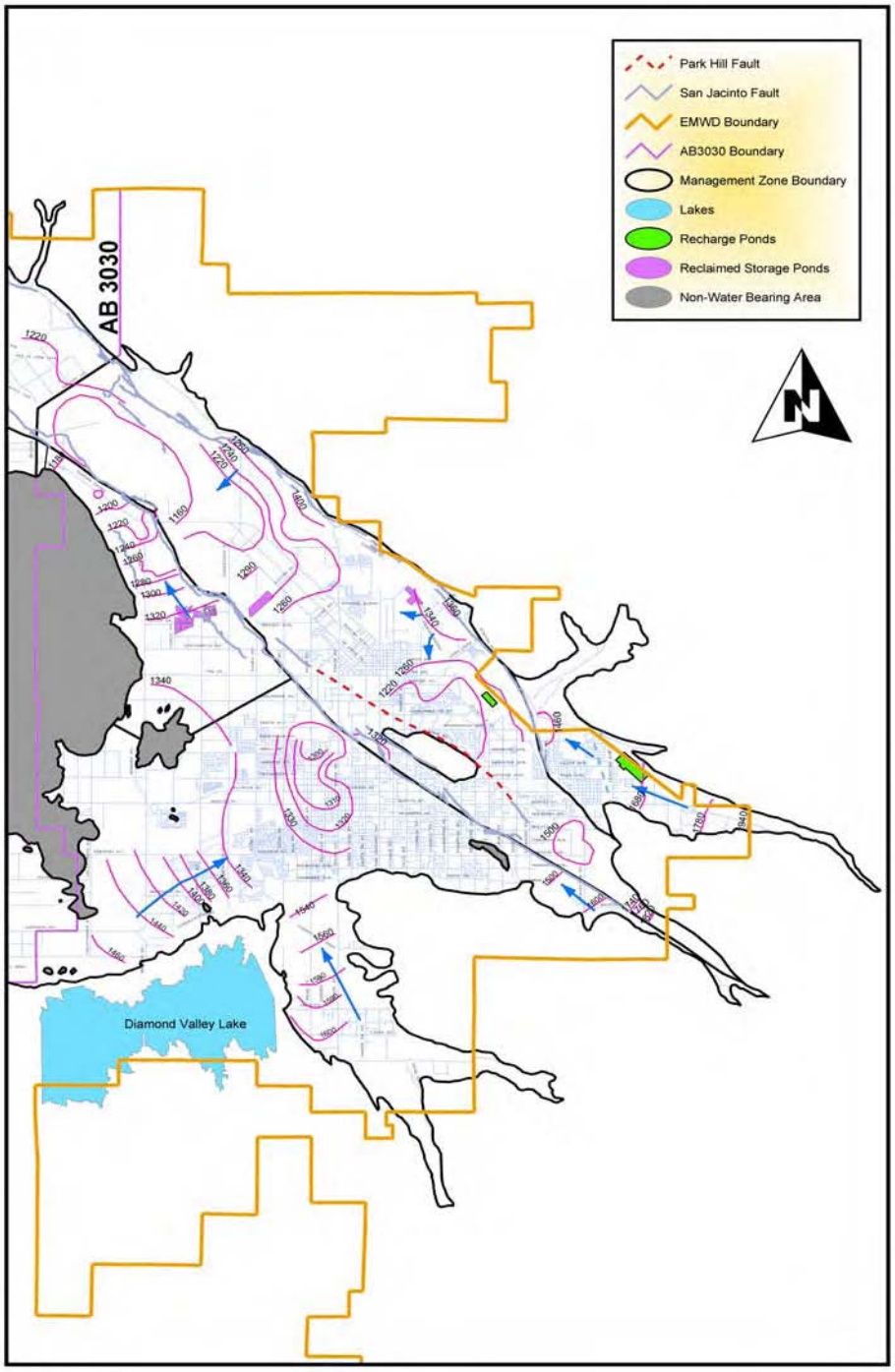
Water Levels

EMWD and others measured over 170 wells in both the spring and fall of 2004. These measures were used to help determine the direction of flow. Water levels taken in the fall of 2004 were also compared to levels measured in fall of 2003 to determine the change in storage. In three out of the four management zones, there was a decrease in groundwater storage, only in Hemet North portion of the Lakeview/Hemet Management Zone showed an increase in groundwater storage. Table 3.2 gives the average change in groundwater storage for 2003 to 2004. Figure 3.2 shows the water level contours for the Hemet/San Jacinto Water Management Area.

Table 3.2 - Average Changes in Groundwater in Storage, 2003 to 2004

Management Zone	Change	Acre Feet
Canyon	Decrease	-1,700
San Jacinto Upper Pressure	Decrease	-3,000
Hemet North (partial)	Increase	600
Hemet South	Decrease	-5,900
Total		-10,000

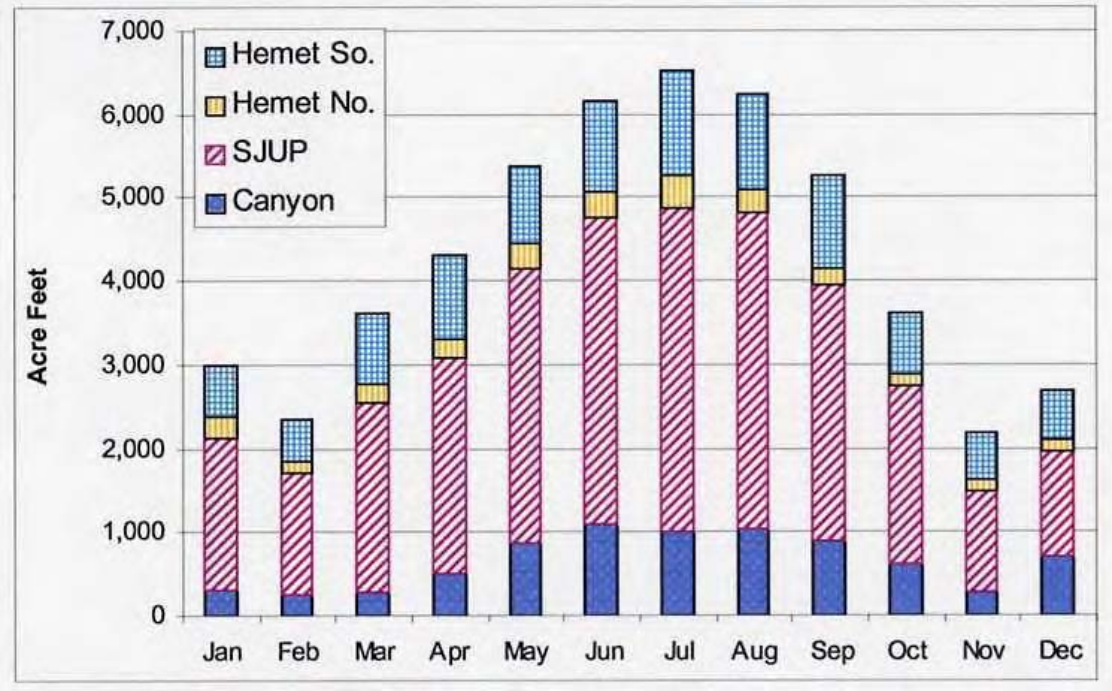
Figure 3.2 – Hemet/San Jacinto Water Management Area Water Level Contour Map



Water Extraction

One hundred and eighty-two wells have been identified in the Hemet/San Jacinto Water Management area. One hundred and forty-nine of these wells are metered, the remaining are estimated based on land use, size, or the number of cows in the case of dairies. In 2004, 51,387 AF of water was produced by all of the users in the basin area. Of the total, nearly 60% of the water was produced between May and September. The water production by month is summarized in the chart below.

Figure 3.3 - Monthly Production by Management Zone



Operational Yield

According to *the Operational Yield Study, Hemet/San Jacinto Groundwater Management Area* (WRIME, Inc., 2003), the operational yield of the groundwater system ranges from approximately 30,000 AFY to 64,000 AFY, with an average of about 41,000 AFY. The operational yield is the long-term withdrawal from the groundwater system not exceeding natural and artificial recharge to the system. From 1958 - 2001 there was an average production of about 50,000 AFY. However, production from 1994 to 2001 was about 68,000 AFY. This is about 27,000 AFY above the average long-term yield estimate. As part of the groundwater management plan, imported water will be added to the basin and the production will be limited to the operational yield.

Recharge

In April of 2004, EMWD, LHMWD and the Cities of Hemet and San Jacinto executed a MOU for an Interim Water Supply Plan. The purpose of the plan was to address the deteriorating situation in the Hemet/ San Jacinto area by providing about 6,000 AF of recharge during the 2004 calendar year. Then, between January 20 and October 24 of 2004, 5,998 AF of imported water from the State Water Project (SWP) was recharged

into the basin at two sites – the Conjunctive Use Ponds in the Intake portion of the San Jacinto Upper Pressure Management Zone and the Grant Avenue Ponds in the Canyon Management Zone.

In November of 2004, a second recharge effort was initiated with the goal of recharging 8,000 AF in 2005. For the 2004 recharge effort, EMWD, LHMWD, and the City of Hemet contributed funding to the purchase and recharge of the SWP, and the City of San Jacinto agreed to reduce groundwater production from the basin to help offset recharge costs. For the 2005 recharge effort, all parties are contributing funds to the program. Under the Water Management Plan, any future conjunctive use projects will be done with the approval of the Watermaster.

Currently, preparation is underway to implement the Hemet/San Jacinto Recharge and Recovery Program. This project will involve 100 acres of ponds, eight recovery wells, and a 60-inch diameter pipeline from EMWD's EM-14 connection to the ponds. The objectives of the project:

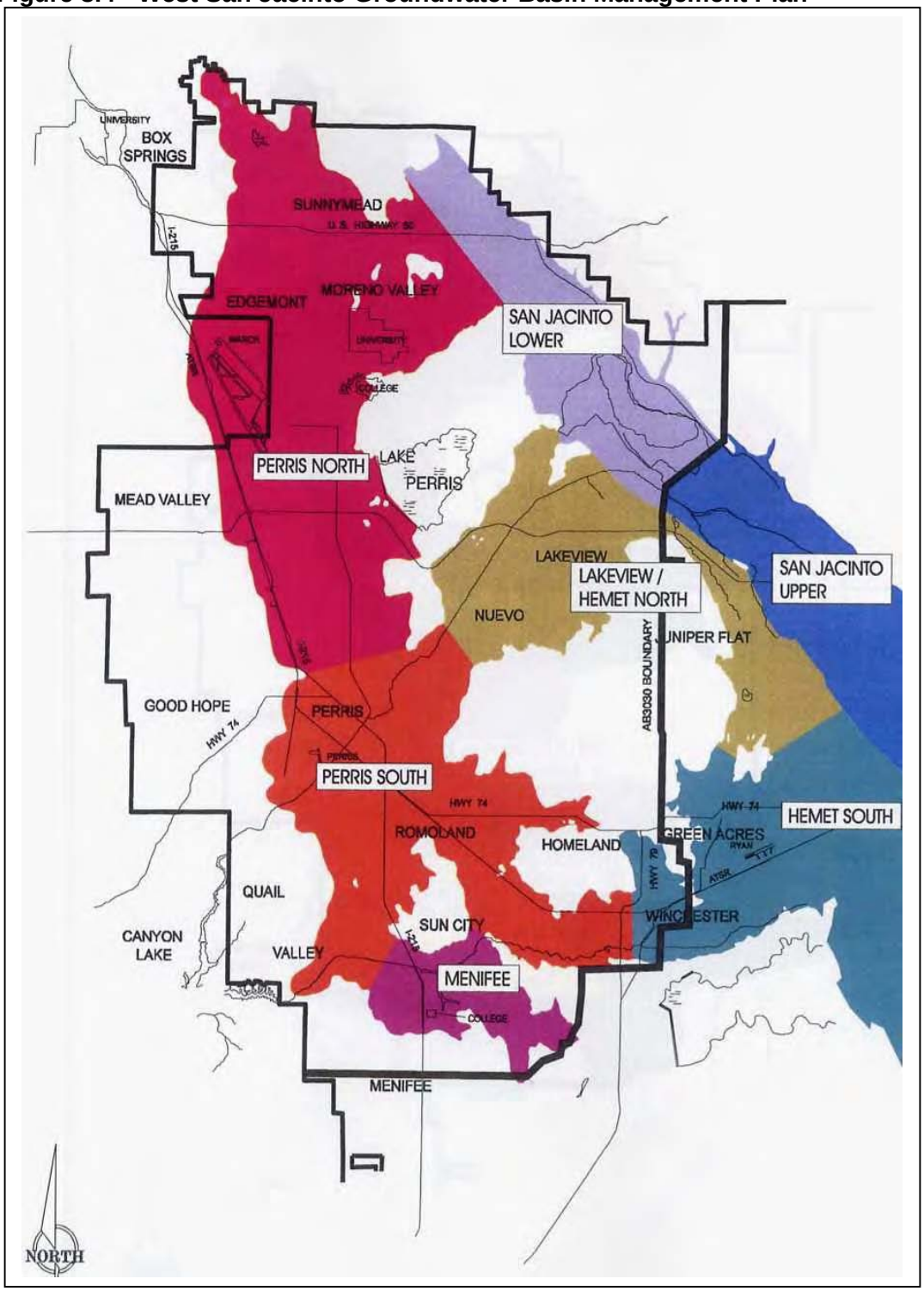
- Provide Tribal Settlement Water - 7,500 AFY
- Elimination of Groundwater Overdraft – 10,000 AFY
- Additional Long-term Supply – 15,000 AFY
- Water Storage for Drought Years – 45,000 AFY

EMWD is currently working with the US Army Corp of Engineers to complete a federal Environment Impact Statement (EIS) in order to obtain a Section 404 Permit and a Section 7 Permit under the Endangered Species Act. The EIS and permitting are both scheduled to be complete in November of 2005. EMWD will also be required to obtain a Streambed Alteration Permit from the California Department of Fish and Game and a 401 Certificate from the Regional Water Quality Control Board.

In addition to the recharge of SWP, there is some incidental recharge of recycled water from a storage pond EMWD has in the area and the MWD San Jacinto Reservoir.

EMWD also has the right to divert surface water from the San Jacinto River to recharge the Canyon sub-basin. Because the San Jacinto River is an ephemeral river, the river does not flow every year. During 2004, flows were insufficient for EMWD to divert water.

Figure 3.4 - West San Jacinto Groundwater Basin Management Plan



History of the West San Jacinto Groundwater Basin Management Plan

In the west San Jacinto area, a cooperative groundwater management plan is already in place to insure the reliability and quality of the water supply. In June 1995, EMWD adopted the West San Jacinto Groundwater Basin Management Plan in accordance with the statutes in the State Water Code resulting from the passage of Assembly Bill 3030

(AB 3030). The plan was adopted after extensive public outreach and meetings with interested individuals and agencies. Implementation of the plan began directly after its adoption. Initial efforts to implement the plan included establishing an advisory committee; prioritizing the sub-basins; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. There have been nine annual reports resulting from the West San Jacinto Groundwater Management Plan, each documenting the implementation of the plan and activities in the sub-basins.

The most recent report was published in April of 2005. It has a thorough accounting of the status of the sub-basins or management zones. Topics covered by the report include the results from EMWD's groundwater quality, water level, and extraction monitoring programs, progress in capping and sealing inactive wells, development of a Regional Water Resources Database, existing and proposed desalters, and other activities in the sub-basins.

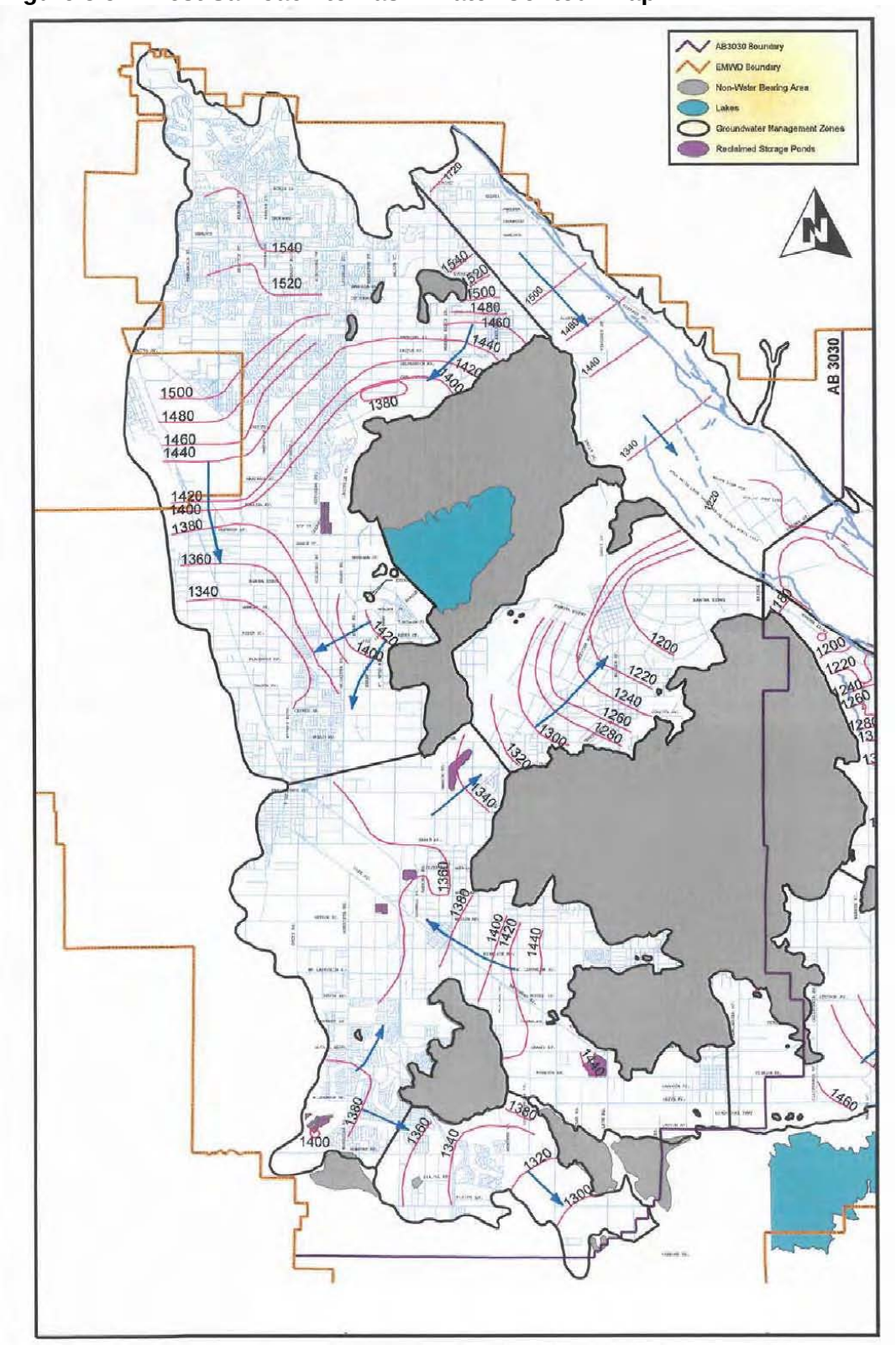
Water Quality

During 2004, as part of the groundwater monitoring efforts, 115 water quality samples were taken from wells in the West San Jacinto Groundwater Management Plan area. The water with the highest TDS level was found in the southwest portion of the Perris South Management Zone. The highest level was 10,300 mg/L. The lowest TDS level of 270 mg/L was found in the northwest portion of Perris North Management Zone. Measurements from 135 wells were sampled and in 2003 and 2004 were used to calculate the statistical volume weighted averages for TDS and NO_3 –N in mg/L for each management zone in 2003 and 2004. The Lakeview portion of the Lakeview/Hemet North Management Zone and in the Perris North and Menifee Management zones show an increase in volume weighted average TDS concentrations. The Perris South Management Zone showed a significant decrease in the volume-weighted average NO_3 –N. Water quality and the character of groundwater are determined by a number of factors including: type and mineral content of sediments; recharge and drainage patterns; historic land use patterns; and screening interval and depth of wells sampled. Fluctuation in high and low values for water quality can also occur because the same wells are not sampled each year. See Chapter 3 of the West San Jacinto Groundwater Basin Management Plan 2004 Annual Report for more information about the water quality of the basin.

Water Levels

In spring 2004, water levels were measured in 150 wells. In addition to giving information on the water levels from year to year, these measurements provide information on the direction of flow. The direction of flow has remained fairly consistent from year to year in the West San Jacinto Basin. There were 135 wells with groundwater level measurement in both 2003 and 2004. These measurements are used to estimate the changes in storage from year to year. In 2004, the Lakeview Portion of the Lakeview/Hemet North Management Zone showed a significant increase in groundwater storage. The Perris North Management Zone showed a minor increase, while the Perris South and Menifee Management Zone showed a slight increase in groundwater shortage. The San Jacinto Lower Pressure Management Zone displayed a slight decrease in groundwater storage. See Figure 3.5 for a water level contour map.

Figure 3.5 – West San Jacinto Basin Water Contour Map



In addition to monitoring water quality and water levels, the basin management plan monitors groundwater production in the basin. Groundwater production in the basin totaled 18,742 AF in 2004 only 13 feet more than in 2003. This production is measured in 54 wells and estimated in 21 wells as part of the Groundwater Extraction Monitoring Program. Table 3.3 shows the extraction from the basin from 2000 to 2004. This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD.

Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management Area

Management Zone	No. of Wells Metered	No. of Wells Estimated	Total No. of Wells	GW (AF) Production Metered	GW (AF) Production Estimated	Total GW Production (AF)
Lakeview/Hemet North (partial)	22	1	23	3,923	20	3,943
Perris North	14	8	22	5,609	1,900	7,509
Perris South	10	1	11	2,286	30	2,316
S.J. Lower Pressure	3	3	6	275	70	345
Menifee	4	7	11	719	3,820	4,539
Hemet South (partial)*	1	1	2	80	10	90
Total	54	21	75	12,892	5,850	18,742

*Only a small portion of the Hemet South Management Zone is within the West San Jacinto Groundwater management Area. The remaining portion is within the Hemet/San Jacinto Management Zone and included in figure 3.2.

Desalters

As part of the West San Jacinto Groundwater Management Plan, EMWD has implemented a Groundwater Salinity Management Program. This program consists of three desalination facilities, two that are constructed and one that is in planning and design. These facilities recover high TDS water in the Menifee and Perris South Groundwater Management Zones for potable use. In addition to being a source of water, the main role of the desalter is to play a part in managing the groundwater sub-basins by addressing the migration of brackish groundwater into areas of good quality groundwater.

The Menifee Desalter was the first of three desalters to be built. This facility began producing potable water in 2003. In 2004, the Menifee Desalter produced 1,441 AF of potable water using water from two production wells. A third well began production and will increase the output of the desalter in 2005.

The second desalter, the Perris Desalter, is located next to the Menifee Desalter at the Sun City Regional Water Reclamation Facility. This plant was completed in spring of 2005 and will increase production of desalinated water from 3 to 7 MGD.

The final desalter, currently under design, is the Perris II Desalter. As part of design, four test wells have been drilled. Initial tests of the wells indicate production rates between 750 and 1,000 GPM with TDS concentrations between 2,000 and 3,000 mg/L. It is anticipated that the test wells and transmission lines for the Perris II Desalter will be completed in spring of 2006.

Groundwater Pumping Rights

In the eastern portion of the Hemet/San Jacinto area, EMWD's groundwater production is currently constrained by the 1954 Fruitvale Judgment and Decree. Under that Judgment and Decree, EMWD, as successor-in-interest to the Fruitvale Mutual Water Company, may extract the subsurface waters of the Canyon Basin for use over or outside the Entire Basin without restriction as long as the static water level in a specific well is not over 25 feet below a specific elevation. If the water level in the well is more than 25 feet below the specified elevation, EMWD's extraction is limited to 4,500 AFY. The District may extract from the entire basin a total of not more than 12,000 AFY for use outside the basin for use over the entire basin, subject to the 4,500 AFY Canyon Basin extraction limit. The perimeters of the areas of the Canyon and entire basins are defined in the Judgment and Decree. The Hemet/San Jacinto area contains good quality water and is a major source of municipal as well as private production, although water levels are in serious decline. Once the Hemet/San Jacinto Stipulated Judgment is in effect, it will supercede the Fruitvale Judgment and Decree.

West of the Hemet/San Jacinto area, the West San Jacinto Groundwater Basin Management Plan was adopted in 1995. This 250 square mile area is experiencing increasing water levels due to high TDS groundwater and decreased production. The high TDS groundwater is migrating into the Lakeview portion of the Lakeview/Hemet North management zone, an area of good quality groundwater. Lowering groundwater levels and removal of saline groundwater is an integral element in the West San Jacinto Groundwater Basin Management Plan. Continued operation of the Menifee Desalter and construction of the Perris I and Perris II Desalters was recommended in the West San Jacinto Groundwater Basin Management Plan 2003 Annual Report on the Status of the Sub Basins. Increasing production of usable groundwater, and production of brackish groundwater for desalination, and blending continue to be elements of the management plan.

EMWD is committed to maintaining the stability of the basins through cooperative groundwater management programs that provide a forum and mechanism whereby local groundwater producers may jointly work to ensure basin quality and quantity.

Past Production
Water Code 10910 (f)(3)

Table 3.4 depicts the total potable groundwater pumped by EMWD from 2000 to 2004. The majority of EMWD's groundwater is pumped from the Hemet and San Jacinto area. The remaining groundwater is pumped from the area covered by the West San Jacinto Groundwater Basin Management Plan. Production from the desalter did not begin until 2003. The location of wells used to pump groundwater and the desalters can be seen on Figure 2.1

Table 3.4 - Amount of Groundwater Pumped – AFY

Basin Names	2000	2001	2002	2003	2004
Hemet/San Jacinto Basin EMWD	17,458	17,717	15,126	15,370	12,516
Hemet/San Jacinto Basin Watermaster	0	0	0	0	0
West San Jacinto Basin	3,381	3,262	3,487	3,880	4,049
West San Jacinto Basin Desalters	0	0	0	282	1,441
Total	20,839	20,979	18,613	19,532	18,006

Projected Production
Water Code 10910 (f) (4)

Table 3.5 lists the amount of potable groundwater that EMWD is projecting will be supplied. Groundwater production in the San Jacinto Valley, some of which is currently covered by the Fruitvale Judgment and Decree, will decrease when the water management plan is put into place. The Perris/Moreno Valley wells are projected to continue to produce 6,000 AF. The desalters will decrease salinity in the basin with the added benefit of providing a source of potable water. The well locations shown in Figure 2.1 should remain consistent in the future.

Table 3.5 - Amount of Groundwater Projected to be Pumped - AFY

Basin Names	2005	2010	2015	2020	2025	2030
Hemet/San Jacinto Basin EMWD	12,000	7,200	7,200	7,200	7,200	7,200
Hemet/San Jacinto Basin Recovered Water	0	5,600	6,600	6,400	6,200	6,200
West San Jacinto Basin	6,000	6,000	6,000	6,000	6,000	6,000
West San Jacinto Basin Desalters	3,600	7,500	12,000	12,000	12,000	12,000
	23,605	28,310	33,815	33,620	33,425	33,430
Total	**17%**	**17%**	**17%**	**15%**	**14%**	**13%**

Section 4 – Reliability of Supply

EMWD delivers water to its customers from three sources; imported water from MWD, groundwater from the San Jacinto Basin and recycled water. The Regional Urban Water Management Plan developed by MWD assures the reliability of imported water supply to its member agencies through a multiple-year drought or single dry year through 2030. The management plans and recharge efforts help insure that the San Jacinto basin remains reliable, and the supply of recycled water will only grow as the population increases. The tables below display the anticipated available water supply in normal, dry and multiple dry years.

Table 4.1 - Supply Reliability Average Year - AFY

	2005	2010	2015	2020	2025	2030
Current Supplies						
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,700	10,950	13,300	15,750	17,500
Recycled Water - Agricultural Use	21,500	17,700	17,500	17,500	17,500	17,500
Imported Water Sources						
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	73,900	72,600	78,200	94,700	88,800	116,800
MWD Untreated AG	2,500	1,200	2,100	2,600	3,100	3,500
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,000	8,250	9,500	10,750	12,000
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources						
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	8,000	20,000	22,200	22,600	22,600	22,500
Total	139,000	168,800	195,000	215,800	213,900	245,200
% of Normal	100%	100%	100%	100%	100%	100%

Table 4.2 - Supply Reliability Single Dry Year (AFY)

	2005	2010	2015	2020	2025	2030
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,800	11,100	13,400	15,900	17,700
Recycled Water - Agricultural Use	23,700	19,500	19,300	19,300	19,300	19,300
Imported Water Sources	0	0	0	0	0	0
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	74,700	73,700	79,500	96,100	108,300	118,400
MWD Untreated AG	2,800	1,300	2,300	2,900	3,400	3,900
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,100	8,300	9,600	10,900	12,100
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources	0	0	0	0	0	0
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	6,900	20,000	22,200	22,600	22,600	22,500
Total	141,100	171,900	198,400	219,400	235,800	249,200
% of Normal	101%	102%	102%	102%	102%	102%

Table 4.3 - Multiple Dry Years Supply Reliability (AFY)

Ending in	2005	2010	2015	2020	2025	2030
Current Supplies						
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,800	11,100	13,400	15,900	17,700
Recycled Water - Agricultural Use	23,700	19,500	19,300	19,300	19,300	19,300
Imported Water Sources						
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	74,700	73,700	79,500	96,100	108,300	118,400
MWD Untreated AG	2,800	1,300	2,300	2,900	3,400	3,900
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,100	8,300	9,600	10,900	12,100
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources	0	0	0	0	0	0
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	5,600	20,000	22,200	22,600	22,600	22,500
Total	139,800	171,900	198,400	219,400	235,800	249,200
% of Normal	101%	102%	102%	102%	102%	102%

Imported Water

As EMWD prepares its 2005 UWMP, MWD is preparing a Regional UWMP (RUWMP). This document provides information about MWD supply reliability and demand calculations. The information supplied in the RUWMP provides assurance that MWD will have a reliable water supply available to deliver to EMWD through 2025, even during dry periods mimicking historical patterns. The RUWMP is available through contacting MWD or on MWD's website.

MWD's Board of Directors has developed the following mission statement **"***To provide its service area with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way."* To fulfill their mission, MWD has taken a coordinated approach to regional planning through the Integrated Resources Plan (IRP). The IRP 2003 Update is available through contacting MWD or on MWD's website.

The IRP was first implemented in 1996. MWD and member agencies worked together to first gather and analyze data to determine demand and supply alternatives, then to use the information gathered to develop a diverse mix of resources. The plan ensured MWD and member agencies would meet all full-service demands without interruption through 2020. It set targets for conservation, local supplies, SWP supplies, CRA supplies, groundwater banking, and water transfers. Using a diverse mix of resources, MWD and its agencies reduced dependency on any single water supply resource.

In 2001, MWD began the process of updating its IRP. The goal was to review and measure achievements since 1996, to identify changed conditions and make adjustments and to extend the planning period to 2025. After extensive cooperation with member agencies and other organizations, the plan was adopted in July of 2004. The update found several changed conditions and extended the reliability to 2025.

Significantly changed conditions listed in the 2003 Update were higher conservation savings, Board-revised goals for the SWP and the CRA, more stringent water quality laws and risk in resource implementation. Two areas of concern are the increasingly stringent water quality regulations and the risk associated with implementing planned projects. To manage those and other areas of concern, the IRP Update institutes a planning buffer of up to 10% of regional demands. This buffer calls for MWD to develop 500,00 AF of supply in addition to resource targets by 2025. This supply buffer is developed through increased targets for local supply and an increase of supply from Central Valley transfers. The supply buffer is part of MWD's practice of developing supply at least ten years in advance of need. More information on the IRP is included in Section II.1 of the RUWMP.

To evaluate the reliability of the supply, MWD has developed a computer model named IRPSIM. This model uses historic hydrologic data from 1922 to 1991 to develop estimates of water surplus and shortage over a 20-year planning horizon. The model assists staff in developing a strategy that balances risk and cost and allows them to manage water supplied from multiple sources. There are two basic types of supply. Core supplies include recycled water projects, safe-yield groundwater extraction, and CRA base supplies. These sources supply water to MWD every year. Flexible supplies only provide water when needed. Examples of flexible supplies are voluntary water transfers and storage. Tables 4.4 to 4.6 summarize the results from the IRPSIM model studies performed to test the supply reliability of the resources mix adopted in the IRP. The results are given for a multiple dry year's scenario using hydraulic data from 1990-92, a single worst case dry year using 1977 historic hydraulic data, and for an average year. The IRPSIM analyze shows that MWD is 100% reliable under dry conditions for the period from 2010 to 2030.

More information on the IRPSIM Modeling is Section 2 of the IRP Update. Water supply reliability is also discussed in Section II.3 and appendix A-3 of the RUWMP.

Table 4.4 – Basis of Water Year Data

Water Year Type	Base Year	Historical Sequence
Normal Water Year		1992-2004
Singe-Dry Water Year	1977	
Multiple –Dry Water Year	1990-1992	

Table 4.5 – Average Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	711,000	678,000	677,000	677,000	677,000
California Aqueduct	1,772,000	1,772,000	1,772,000	1,772,000	1,772,000
In-Basin Storage	0	0	0	0	0
Supplies Under Development					
Colorado River Aqueduct	0	0	0	0	0
California Aqueduct	185,000	185,000	240,000	240,000	240,000
In-Basin Storage	0	0	0	0	0
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Firm Demands on Metropolitan	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
Potential Reserve & Replenishment Supplies	628,000	547,000	665,000	539,000	405,000

Table 4.6 - Dry Year Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	722,000	699,000	699,000	699,000	699,000
California Aqueduct	777,000	777,000	777,000	777,000	777,000
In-Basin Storage	840,000	838,000	808,000	784,000	784,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	259,000	350,000	350,000	350,000
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,842,000	3,101,000	3,102,000	3,078,000	3,078,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,842,000	3,033,000	3,002,000	2,970,000	2,970,000
Firm Demands on Metropolitan	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
Potential Reserve & Replenishment Supplies	549,000	732,000	768,000	607,000	481,000

Table 4.7 - Multiple Dry Year Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	722,000	699,000	699,000	699,000	699,000
California Aqueduct	912,000	912,000	912,000	912,000	912,000
In-Basin Storage	482,000	480,000	463,000	449,000	449,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	215,000	299,000	299,000	299,000
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,619,000	2,741,000	2,741,000	2,719,000	2,719,000
Firm Demands on Metropolitan	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
Potential Reserve & Replenishment Supplies	243,000	377,000	424,000	265,000	132,000

In April of 1999, MWD adopted the Water Surplus and Drought Management Plan (WSDM Plan). This plan provides guidelines for managing water resources to achieve the reliability goals of the IRP. The guiding principle of the WSDM Plan is to manage MWD's water resources and programs to maximize management of supplies in wet years and minimize adverse impacts of water shortages to retail customers. MWD does this, in part, through encouraging efficient water use and economical local resource programs, coordinating with sub agencies to make surplus water available in dry years, pursuing transfer and banking options, and increasing public awareness about water supply issues. MWD fully expects to be 100% reliable for delivery of non-discounted, non-interrupted demands through 2025. If any allocations should become necessary, those allocations will be based on need, as opposed to any historical purchases. Further discussion of the WSDM Plan is included in Section 11.4 of the RUWMP.

EMWD participates and supports MWD's efforts to ensure reliability. One of the resource programs EMWD is constructing, Reach 16, is co-funded by MWD. Reach 16 is a recycled water pipeline that will remove 720 AF of potable water demand from the system and replace it with recycled water. EMWD is also using surplus SWP water to recharge the San Jacinto Basin so that there will be groundwater available to meet demands during dry years.

Based on the information detailed in MWD's RUWMP, EMWD is confident that MWD will provide EMWD with enough non-discounted, non-interrupted water supplies to meet demands through 2030. EMWD's only interruptible supply is discounted agricultural water, which accounts for approximately 4% of the District total supply, and the recharge water used for the San Jacinto Basin. It is anticipated that recharge water may not be available in one out every five years. If there is a shortage of imported water that cannot be supplemented by local supplies, EMWD will make up the deficiency by implementing the water shortage contingency plan.

Groundwater

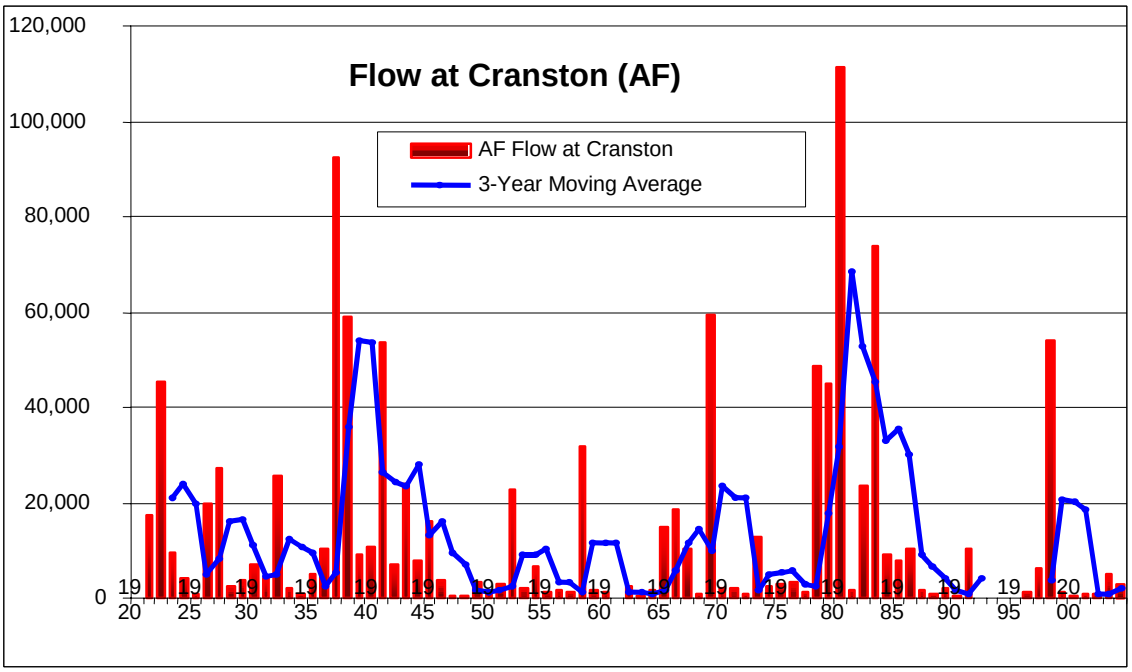
EMWD's 550-square mile service area spans two watersheds, the San Jacinto in the north and the Santa Margarita River in the south. In the San Jacinto Watershed, the Hemet/San Jacinto area to the east occupies about 23% of the District, and the West San Jacinto Groundwater Management Plan area to the west occupies approximately 49% of the District. The Santa Margarita River watershed portion of the District to the south covers approximately 28%.

Hemet/San Jacinto Area

Groundwater is, and historically has been, the primary source of supply in the Hemet/San Jacinto area. In 2004, 83% of EMWD's demand in the area was supplied by groundwater, while 17% was supplied by imported water. Twelve of sixteen active wells in the Hemet/San Jacinto area produced more than 12,500 AF of water during 2004.

Groundwater supplies are dependent upon precipitation locally, as well as in the mountains, to provide flow in the San Jacinto River to recharge the basins. The U.S. Geological Survey has maintained a gauging station at Cranston Ranger Station on the San Jacinto River for all but four years since 1920. The following figure shows annual San Jacinto River flow along with a three-year moving average.

Figure 4.1: - Annual San Jacinto River Flow



Based on data from the USGS gauging station, the following have been identified and defined:

Table 4.8 - Normal, Single-Dry, and Multiple-Dry Years

Term	Definition	Year(s)	Flow (AF)
Normal Year	Median Runoff Level (1920 through 2004)	1946	3,775.53
Single-dry Year	Lowest Annual Runoff for Watershed	1920	73.19
Multiple-dry Year Period	Lowest Average Runoff for three Consecutive Years	2000/02	714.69

During both Single- and Multiple-dry years, EMWD met customer demands without interruption of service.

An analysis of hydrologic reliability was conducted based on the 2000-2002 Multiple-Dry Year Period using data from three EMWD production wells in the Canyon and three in the Intake portion of San Jacinto Upper Pressure Management Zone. The results are shown in the following table:

Table 4.9 - Results of Hydrologic Reliability Analysis
(Decline in Water Levels is in Feet and
Depths to Water or Screens are in Feet Below Ground Surface)

	Area:	Canyon			SJUP Intake		
	Well:	# 17	# 26	# 34	# 18	# 27	# 28
1	Decline in Water Levels (Depth to Water) following 2000/02 Dry Period	142	152	144	85	64	86
2	Depth to Water as of June 2005	194	196	198	419	359	430
3	Projected Depth to Water Following Another Dry Period Similar to 2000/02	336	348	342	504	423	516
4	Depths of Lower Limit of Well Screens	1,122	1,460	1,050	1,000	1,676	1,480

Given current conditions, even if another multiple-dry year period produces a decline in water levels similar to that produced in 2000-2002, the wells will still be operable and capable of producing. The basin may become over drafted, but production would continue.

Groundwater management is an important element in maintaining water reliability. In the Hemet/San Jacinto area, the water purveyors and local groundwater producers have been working to put a water management plan in place. In the Principles for Water Management, each agency - EMWD, Lake Hemet Municipal Water District, and the Cities of Hemet and San Jacinto - agreed to a methodology for determining their base production rights. It is the goal of the Management Plan to adjust base production rights over time to a level consistent with the calculation of the agencies' share of safe-yield for the management area. After plan implementation, the agencies will be subject to replenishment of water pumped in excess of their adjusted base production right.

In the meantime, prior to plan implementation, the agencies agreed to address the deteriorating situation in the sub-basins and to reduce the historical impact of overdraft caused by past groundwater production. The Interim Groundwater Recharge Program involved the application of approximately 6,000 AF of SWP recharge during 2004 at two existing recharge pond sites located in the San Jacinto Riverbed. The water was recharged and funded under the 2004 Interim Water Supply Plan. An additional 778 AF was recharged in 2004 in anticipation of the execution of a similar MOU for 2005. That MOU was executed and provides for up to 8,000 AF of recharge, which is currently underway.

West San Jacinto Groundwater Management Plan Area

Groundwater plays a lesser role in the West San Jacinto Groundwater Management Plan area. In addition, groundwater supplies in the West San Jacinto area are not dependent upon San Jacinto River flows. Imported water accounted for 53,000 AF or more than 90% of the area's demands. During 2004, five production wells produced 4,050 AF of water and three desalter wells produced 1,990 AF of brackish groundwater for the desalination plant. If, due to drought or some other cause, groundwater supplies were not available, EMWD would first try to meet its customer's demands through imported water. If imported water were not available, then the Water Shortage Contingency Plan would be implemented.

Santa Margarita Watershed

EMWD serves and wholesales imported water in the portion of the Santa Margarita River Watershed that falls within District boundaries. Groundwater does not play a role in EMWD's efforts in this area.

Recycled Water

EMWD operates and maintains four regional water reclamation facilities and all are currently undergoing or planning an expansion. These facilities treat water collected in EMWD's wastewater system for use as recycled water. As the service area population grows, the supply of recycled water continues and as land becomes less available for agriculture, there is a greater supply of recycled water available for municipal and industrial purposes. EMWD's recycled water supply is not dependent on weather patterns and may actually increase slightly in dry years. Wet years, at times, will pose a greater operational challenge as storage facilities fill and customer demand decreases.

Section 5 - Transfers and Exchanges

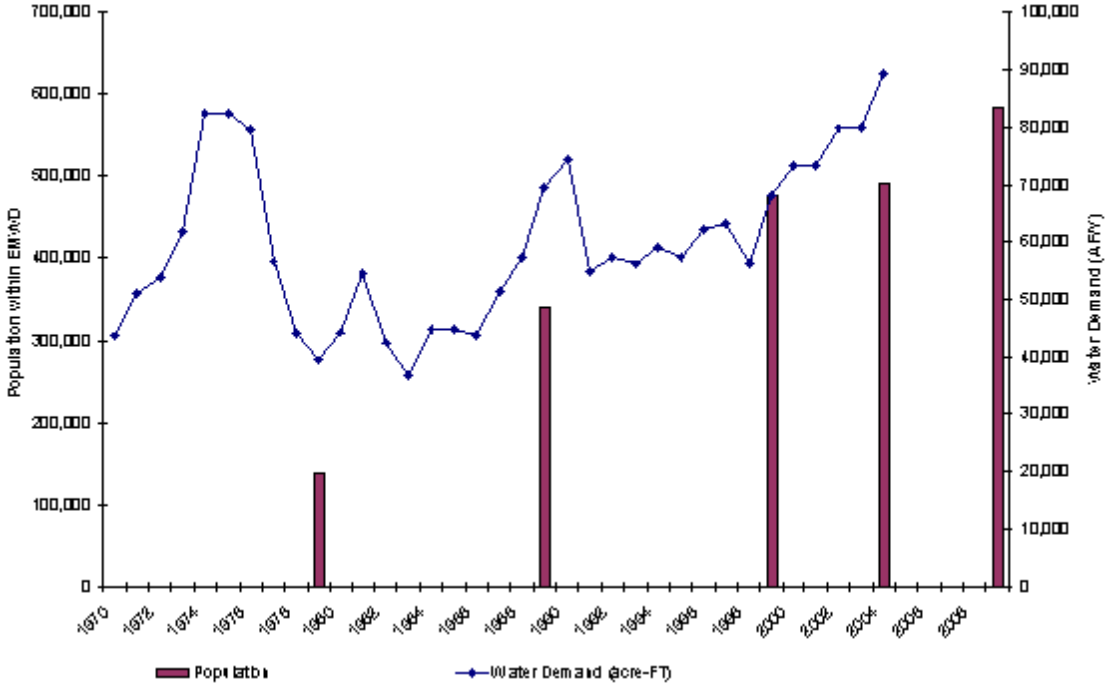
EMWD currently relies on Metropolitan Water District of Southern California (MWD) for any transfers or exchanges. As a member agency, EMWD benefits from MWD's efforts to improve supply reliability through transfers and exchanges detailed in the 2005 Regional Urban Water Management Plan.

In addition to relying on MWD, EMWD is investigating opportunities for independent transfers and exchanges. A consultant has been hired and is actively researching the possibility of cost-effective transfers and exchanges for EMWD. Since there is no guarantee that exchanges or transfers will be feasible for EMWD, and its impossible to quantify the amount of water that could be made available, transfers and exchanges are not listed as part of EMWD water supply.

Section 6 - Water Use by Customer Type

Since the last UWMP published in 2000, EMWD has experienced a period of accelerated growth. The number of customer meters has jumped to over 100,000, the majority of them in new single-family homes. In the past, water demand has remained relatively constant despite large jumps in population growth. Declining agricultural demand has offset the increasing domestic demand. Now, agricultural demand is relatively stable and the domestic market continues to grow. Even the recycled market is starting to shift from agricultural to other uses. For the last five years, population growth has driven up water use and it is expected to do so for the foreseeable future. The chart below tracts water sales compared to population from 1970 to 2004.

Figure 6.1 – Population Growth vs. Water Demand



More and more of the land in EMWD's service area is shifting away from open space and agriculture. EMWD maintains a Database of Proposed Projects (DOPP). This data base tracts major developments from planning through construction. The database is continually updated and revised as projects reach different stages of development. Currently, there are approximately 651 proposed projects on over 56 thousand acres within EMWD's service area. These projects would create nearly 150,000 new residential units and over 10,000 acres of commercial, industrial, institutional, parks, open space or other non-residential development. This database contains projects that may not be developed for years or even decades. EMWD uses population projections from the Southern California Association of Governments 2004 Transportation Analysis study to determine local absorption studies and information contained in the DOPP to determine its population growth from 2005 to 2025.

Retail Market Segments

EMWD has several different water markets. EMWD's primary customers are retail purchasers of potable water. These customers can be divided into residential, commercial, industrial, institutional and landscape sectors. Although the residential section is by far EMWD's largest customer segment, each market segment plays a role in the growth and development of EMWD's service area. See table below for the water use by various customer types.

Table 6.1 - Water Use by Customer Type-AFY

Year	Water Use Sectors	Single Family	Multi-Family	Com-mercial	Indus-Trial	Instit-Gov	Land-scape	Agri-Cultural	Total
2000	# of accounts	82,459	831	978	101	229	1041	413	86,051
	Deliveries	45,536	4,458	3,018	433	2,250	5,675	7,029	68,399
2005	# of accounts	108,956	1,098	1,292	133	302	1,375	185	113,341
	Deliveries	65,951	6,456	4,372	627	3,,258	8,220	3,152	92,036
2010	# of accounts	128,575	1,312	1,525	157	357	1,623	165	133,715
	Deliveries	74,764	7,414	4,957	710	3,695	9,321	2,776	103,637
2015	# of accounts	149,105	1,548	1,768	182	413	1,881	143	155,039
	Deliveries	87,419	8,814	5,792	830	4,317	10,891	2,403	120,466
2020	# of accounts	166,950	1,754	1,974	203	461	2,101	122	173,565
	Deliveries	98,535	10,058	6,512	933	4,853	12,244	2,048	135,183
2025	# of accounts	180,753	1,917	2,131	219	498	2,268	122	187,907
	Deliveries	106,503	10,970	7,017	1,006	5,230	13,194	2,048	145,968
2030	# of accounts	191,804	2,052	2,255	232	527	2,400	122	199,392
	Deliveries	112,958	11,737	7,423	1,064	5,533	13,957	2,048	154,720

In addition to potable sales to retail customers, EMWD also sells water to agricultural customers and wholesales water to other agencies. Although agricultural sales have greatly declined from historical numbers, agriculture remains an important part of EMWD's market. Water sales to other agencies are one of EMWD's most volatile demands. The need for EMWD's water can fluctuate every year due to a number of factors.

In addition to potable water sales, EMWD has an active and growing recycled water market. Using recycled water for landscaping and agricultural uses whenever possible allows EMWD to reduce its dependence on imported potable water.

Although their needs and size vary, EMWD is committed to providing water to support the people living and working within the District's 555 square mile service area.

Retail Sales of Potable Water

Residential

Residential use is, and will continue to be, the dominant demand for EMWD. According to the Riverside County Integrated Plan (RCIP), the ultimate land use will be primarily residential. Residential land use can be divided between low, medium and high residential development. Land use with between 0.05 and 3 structures per acre is considered low-density. Low-density residential accounts for over half of the residential land use. Low-density is focused in areas with steep terrain and geographical limitations to higher density land use. Although low-density accounts for over half of the residential land use, it only accounts for 20% of the total demand for water.

Medium-density residential is the second highest residential land use. Medium-density land use has between 4 and 8 dwelling units per acre and will account for more than half of the water demand at build out. Although there is less land dedicated for medium-density residential use in EMWD, the higher rate of water use per acre leads to higher water demand for medium-density residential customers. Much of the development currently occurring in EMWD's boundary is medium-density residential. Large tracts and specific plans are replacing rows of agricultural crops with rows of new housing throughout EMWD.

High-density residential accounts for the smallest area of residential land use. High-density residential has more that eight dwellings per acre and is usually multi-family. High-density residential includes apartments, town homes and condominiums. EMWD is starting to see an increase in the number of high-density projects being built in areas that are already densely populated. As land use within EMWD's services area continues to move from open space and agriculture, high-density residential development will continue to grow.

Commercial Sector

The commercial sector will also continue to grow as the population increases, according to the RCIP. Commercial development will be focused along the major transportation highways through EMWD's boundary - Interstate Highway 15, Interstate Highway 215, Highway 79, and Highway 74. Currently, commercial demands account for about 5% of EMWD's retail sales. According to the RCIP, ultimately, commercial demand will account for 8% of retail sales. This indicates that the commercial sector will continue to grow at nearly the same rate as the population.

Industrial Sector

EMWD has a very small industrial sector, less then 1% of retail demand. As the District grows, there may be a higher rate of industrial growth. The RCIP indicates that ultimate industrial demand may account for up to 4% of EMWD's retail market. Industrial growth will be focused mainly around Interstate Highway 215, when it occurs. As much as possible, EMWD will try to meet the needs of any industrial customers with a very high demand for water using recycled water.

Institutional/Governmental Sector

EMWD has a stable institutional sector that will grow with the population. Currently, the demand from institutional customers accounts for about 4% of retail demand for potable water. The RCIP predicts about 3% of the ultimate water demand will be for public facilities. Whenever possible, recycled water is used for landscape irrigation for schools and other government facilities.

Agricultural Sales – Potable Water

When EMWD was formed, it was primarily to serve the agricultural community with imported water from MWD. Since then, the District has gone through a major transformation from a farming community to a residential community. Currently, agricultural sales account for only about 4% of EMWD's potable water market. This is expected to remain relatively stable for the next twenty years with some fluctuations from year to year due to changes in weather or crop rotations.

Reduction of Retail Demand through Conservation

As EMWD's demographics change and the population grows it is important that every effort is made to reduce water demand through conservation. Already the amount of water needed for the thousands of new homes being built is reduced through plumbing codes implemented in the early 1990's. Low flow toilets and showerheads are mandatory in all new construction. As seen in table 6.2 below, this passive conservation through plumbing codes has already reduced EMWD's demand significantly and will continue to do so in the future. In addition to passive programs, EMWD has implemented all of the California Urban Water Conservation Council (CUWCC) Best Management Practices (BMP). The BMPs and other active conservation programs also reduce EMWD's current demand and will continue to decrease it in the future. These existing practices and laws allow EMWD to project demand lower then it would without these conservation measures.

The demand projected in Table 6.1 assumes that existing conservation laws and programs will remain in place or be replaced with similar efforts. However, EMWD is not content to rely on the existing conservation programs and law. One of EMWD's strategic objectives is to "Promote efficient use of water and implement a structured conservation plan." EMWD is currently developing a conservation plan to reduce water consumption per capita and participating in pilot protects and programs. The continued promotion of conservation through new rebates, programs and education will only continue to reduce demand.

Table 6.2 – Conservation Savings – AFY

	2000	2005	2010	2015	2020	2025	2030
Retail Demand	61,400	92,000	10,3600	120,500	135,200	146,000	154,700
Active Conservation	1,100	1,800	2,600	3,300	4,000	4,700	5,000
Passive Conservation	600	2,800	5,000	7,200	9,200	10,600	11,300
Demand without Conservation	63,100	96,700	111,200	131,000	148,300	161,300	171,000

Wholesale to Other Agencies

EMWD wholesales water to six different agencies. The demand for each agency differs based on its need each year. These demands can be unstable at times as other water districts use water from EMWD to supplement their system when local facilities are inadequate or fail. The majority of wholesale water is delivered to agencies in the Hemet/San Jacinto area. This demand should decrease while needs are met through the recharge and recovery plan. As the population continues to grow and native groundwater production is curtailed, imported water through EMWD will become the supplemental supply for all new growth.

A portion of the water EMWD wholesales to Lake Hemet Municipal Water District is raw water for agricultural uses. This water is needed especially when surface water is not available in dry years. Planning is underway to meet a portion of these agricultural needs with recycled water in the future. See the table below for water sales to other agencies.

Table 6.3 - Sales to Other Agencies – AFY

Sales to Other Agencies	2000	2005	2010	2015	2020	2025	2030
Lake Hemet MWD Ag Water	1,667	2,545	1,200	2,100	2,600	3,100	3,384
Lake Hemet MWD		300	0	0	0	0	0
City of Hemet Water Dept.	591	259	0	0	0	0	0
San Jacinto Water Dept.	0	222	0	0	0	0	0
City of Perris	1,977	2,500	2,641	2,722	2,757	2,769	2,773
Murrieta Water County Dist.	0	300	0	0	0	0	0
Nuevo Water Company	36	775	1,002	1,457	1,745	1,903	1,979
Total Untreated AG	1,667	2,545	1,200	2,100	2,600	3,100	3,384
Total Potable	2,604	4,578	3,643	4,179	4,502	4,672	4,752

Other Water Uses

EMWD has several additional water uses, water used for recharge, recycled water use and water losses. See Table 6.4, for the projected use of water by each type.

Table 6.4 - Other Water Uses - AFY

	2000	2005	2010	2015	2020	2025	2030
Recharge Water	0	8,000	20,000	22,200	22,600	22,600	22,500
Recycled - Industrial Enterprise and Aesthetic Improvement			7,000	8,250	9,500	10,750	12,000
Recycled – Municipal	3,500	3,500	7,700	10,950	13,200	15,750	17,500
Recycled – Agriculture/Wildlife Habitat		21,500	17,700	17,500	17,500	17,500	17,500
System Losses	3,959	6,930	7,900	9,400	10,600	11,600	12,700
Total	7,459	39,930	60,300	68,300	73,500	78,200	82,200

Recharge Water

Under the Hemet/San Jacinto Water Management Plan, EMWD will be responsible for transporting raw water from EM-14 to ponds in the San Jacinto riverbed to recharge the groundwater basin. The SPW imported through MWD will meet the requirements of the Soboba Settlement and improve the reliability of groundwater in the area. After the water is added to the basin, individual agencies including EMWD will extract their allotted amount of water from the basin using wells already in place and new wells yet to be constructed.

Recycled Water

There are three main types of recycled water; 1) municipal customers, 2) agricultural/wildlife habitat customers, and 3) customers using recycled for industrial purposes or aesthetic impoundments. Municipal customers use recycled water for irrigating landscaping. These customers have made a financial investment in the landscape or process that requires water. Without recycled water available, these customers would pay for imported potable water or pump groundwater to protect their investment. It is anticipated that the demand from these customers will increase with population growth and system expansion. Each customer will have a fairly consistent demand each year, with minor fluctuations due to weather. Recycled water use by these customers reduces the amount of potable water that needs to be extracted from groundwater or imported through MWD.

Some agricultural customers often use recycled water to grow short-term row crops. Using potable water would not be cost-effective for these customers. Their profitability is based on the availability of low-cost recycled water and low-cost land available for lease. The location of these customers frequently changes each year depending on where there is land available. As more residential development takes place and the population grows, land is becoming less accessible. As time goes by, EMWD expects to have fewer and fewer of these types of customers. Other agricultural customers use recycled water to irrigate crops that require a long-term investment such as citrus trees. These customers would use potable water if needed to protect their investment. Because potable water has a prohibitive cost, recycled water is also used to support the San Jacinto Wildlife Area.

One final type of recycled water customer is the customer using recycled water for industrial processes or aesthetic impoundment. These customers would not use potable water either because it is not economically feasible or because EMWD policy would not allow it.

The future of EMWD's recycled water market is with municipal customers, customers using recycled water for industrial processes or aesthetic impoundment and long-term agriculture customers. To meet the needs of these customers, EMWD is taking steps to improve the reliability and quality of the recycled water system.

EMWD also sells water to the California Department of Fish and Game for the San Jacinto Wildlife Area. This wildlife refuge was one of the first in the state to use recycled water for habitat creation and recycled water is used to help maintain, enhance and improve this environmental preserve. EMWD is working with the Department of Fish and Game and other interested parties to expand and enhance the use of recycled water for environmental benefits at the San Jacinto Wildlife Area.

Water Losses

EMWD's final water use type is water losses. Water losses account for less than 7% of total water use. Through leaky pipe tracking and replacement, EMWD is continually trying to decrease the water loss rate.

All Use

The sum use of EMWD's water use is seen in the table below.

Table 6.5 - Total Water Use - AFY

	2005	2010	2015	2020	2025	2030
Total Water Use	139,000	168,800	195,000	215,800	231,900	245,200

Section 7 – Conservation

Under EMWD's Strategic Plan, the District is seeking to "*Promote efficient use of water and implement a structured conservation program*." To do this, EMWD is actively working with other agencies and its customers to reduce the amount of water demand placed on groundwater and imported sources. The goal is to reduce our per capita water use rate by 25% over the next twenty years through promoting programs, offering rebates, educating customers and minimizing water loss from EMWD facilities. Two groups that EMWD works closely with to improve conservation efforts are Metropolitan Water District of Southern California (MWD) and the California Urban Water Conservation Council (CUWCC).

Metropolitan Water District of Southern California

EMWD's work with MWD on conservation savings is important for two reasons. First, MWD uses projected conservation savings as part of its calculations when determining supply reliability. Second, MWD is a funding source for many of the conservation programs EMWD implements. Additional information about MWD's conservation program is included in Section II.2 of the RUWMP.

Projected Water Savings

A core element of MWD's water supply plan is conservation. One of the changed conditions in the 2003 Integrated Resource Plan (IRP) update was an increase in conservation savings causing a drop in demand compared to the 1996 IRP. The 2003 update to the IRP had a target for conservation of 1,107,000 AF of savings in 2025. This target was developed using specially designed computer models created to tackle the complex measurement of conservation savings.

In MWD's model, four types of conservation savings are considered:

1) **Active conservation savings** are a result of agency funded or sponsored programs.
2) **Passive conservation savings** are the result of the 1992 California Plumbing code.
3) **Price-effect conservation savings** are due to increases in retail water rates since 1990.
4) **Pre-1990 conservation savings** are from the 1980 California Plumbing code and from price effects from 1980 to 1990.

For "active" conservation savings, MWD takes a regional approach for any conservation that may be implemented in the future. There is not a specific target for each agency but MWD works with all of the sub agencies within its service area to meet conservation goals. Much of EMWD's conservation program has received supplemental funding from MWD and EMWD is continually working with MWD to find new opportunities for water use efficiency.

Because EMWD experienced so much growth after 1992, the majority of the MWD projected conservation savings in EMWD's service area is due to pre-1990 savings, price effects and passive savings from the plumbing codes. Only about 7% of the total projected conservation savings are achieved through the active conservation programs already in place. Since MWD's savings projections are based on savings from plumbing

codes and programs already in place, any additional conservation activities EMWD undertakes will only decrease the reliance on the imported water supply from MWD.

California Urban Water Conservation Council

The CUWCC was created to increase efficient water use throughout the State of California through partnership with urban water agencies, public interest organizations and private entities. The goal of the council is to integrate urban water best management practices (BMPs) into the planning and management of California's water resources. In 1992, EMWD signed CUWCC's Memorandum of Understanding Regarding Water Conservation in California (MOU). By signing the MOU, EMWD committed to developing and implementing fourteen comprehensive BMP's for urban water management. EMWD submits a biennial report to CUWCC describing the status of each BMP. Included as Appendix C are the CUWCC BMP Reports for 2002/2003 and 2003/2004. The BMP's correspond to the fourteen Demand Management Measures listed in Water Code Section 10631 (f).

Best Management Practices

Water Survey Programs for Single – Family Residential and Multi-Family Customers

EMWD has offered free residential water use surveys of its customers since 1991. These surveys examine both indoor and outdoor water uses. They measure flow rates in showers and toilets, check for leaks, recommend water saving devices, check landscape areas and review or develop irrigation schedules. At the end of the survey, customers are provided survey results and water saving recommendations. From 1993 to 2004, over 2,000 water surveys were completed. Funding for the residential surveys comes from EMWD and through MWD's Conservation Credits Program. This program meets the requirements of BMP 1.

Plumbing Retrofits

Plumbing retrofits for residential customers are often recommended or installed as part of the residential surveys. In 2004, low flow showerheads, toilet displacement devices, toilet flappers and faucet aerators were distributed to EMWD customers to increase indoor water use efficiency. In addition to indoor water saving devices, several types of irrigation devices were distributed. MWD is a partner in funding retrofits. This program meets the requirements for BMP 2.

Distribution System Water Audits, Leak Detection and Repair

EMWD continually tracks the amount of water sold and the supply entering the system. Every customer has a service meter. This allows EMWD to determine the amount of water that goes unaccounted for each year. The rate of water loss is currently less than 7%; however, EMWD is continually making an effort to reduce those losses. As part of normal operation and maintenance procedures, all leaks reported are investigated and repaired if they are part of EMWD's system. Pipes with numerous leaks are tracked and replaced as part of the Capital Improvement Plan. Pipe inspection is also routinely conducted by maintenance personnel, in order to determine where leaks are occurring. Grant funding opportunities are pursued to assist in funding leaky pipe replacement when possible. This program meets the requirements for BMP 3.

Metering with Commodity Rates

EMWD is fully metered for all customer sectors and all customers pay the sector rate for each billing unit consumed. Irrigation meters are required for all Commercial, Industrial and Institutional (CII) customers with a landscaped area over 3,000 square feet. EMWD also has separate meters for recycled water meters. As new services are added, meters are installed and read. Older meters are calibrated and replaced as needed. Metered accounts may result in a 20% reduction of water demand compared to non-metered rates. This program meets the requirements for BMP 4.

Large Landscape Water Audits and Incentives

EMWD has over 1,300 dedicated landscape meters. Of these meters, nearly 400 are metered accounts with water budgets. The accounts with budgets have 3,000 square feet or more of dedicated landscaping areas. Each account receives a monthly report and graph indicating account status. If a landscaping customer's water use exceeds its budgeted limit, a fine is levied on the customer. It is estimated that approximately 500 AFY are saved through the large landscape program. This program meets the requirements for BMP 5.

High-Efficiency Wash Machine Rebates

EMWD offers its customers a rebate for purchasing high-efficiency washing machines. From 2001 through 2004, EMWD facilitated rebates for 1,079 high efficiency washing machines. In 2004, 553 rebates were issued for eligible washers purchased. Currently, a rebate of $110 is offered for applicable machines. Since July 2005, only washing machines with a water use factor of 6.0 or less are eligible for this rebate. MWD currently contributes $100 towards each washing machine rebate. This program meets the requirements for BMP 6.

Public Information

Public information is an important part of EMWD's conservation program. Information on water conservation is offered through workshops, bill inserts, EMWD's web site, brochures, community speakers, paid advertising and special events every year. EMWD is developing a survey program to track the effectiveness of its public information campaign. Although the benefits of a public information campaign may not be easily measured, EMWD believes it is in the public's best interest. A portion of the public information program is funded through MWD, especially landscape workshops. This program meets the requirements for BMP 7.

School Education

School education is an integral part of EMWD's conservation efforts. Programs are available for students in kindergarten through the twelfth grade. Full-time staff members are employed to reach out to students through educational tours of EMWD facilities, water conservation theater programs presented in an assembly, distributing free water education materials, administrating a "water-wise" poster contest, making classroom presentations and other educational programs. Over 100,000 students were reached in 2004. As the District continues to grow, so will the number of students reached. This program meets the requirements for BMP 8.

Commercial, Industrial, and Institutional Water Conservation

EMWD encourages conservation by commercial, industrial and institutional water customers in several ways. Rebates are a major part of EMWD's outreach to these water customers. Rebates are offered for ultra-low and dual-flush toilets, and urinals up to $140. There is a $100 rebate for water brooms. In addition to the water broom rebate program, EMWD donated a water broom to every school within its service area, 125 brooms in total. There is also a rebate of $500 for cooling tower conductivity controllers that will cut water use up to 40%. Replacing a kitchen sprayer with one that can save water is eligible for a $50 rebate. High-efficiency washing machines receive a rebate of $100 and an X-ray film processor recycling system that reduces water use up to 98% has a rebate of $2,000. Information about all of these rebate programs is readily available to customers on EMWD's web site.

EMWD also offers free guest towel and bed linen placards for hotels and motels, and offers water use surveys to commercial, industrial and institutional customers. For outdoor conservation, any commercial, industrial and institutional customer with landscaped areas larger than 3,000 square feet is part of the large landscape program and on a water budget. MWD provides much of the funding for the rebate offered to commercial, industrial and institutional customers and conducts periodic marketing campaigns for the program. This program meets the requirements for BMP 9.

Wholesale Agency Programs

BMP 10 concerns the actions of wholesale agencies. As a wholesale agency, EMWD encourages each of its sub agencies to participate in rebate programs, and in the past, has worked with individual agencies to promote water conservation in the region. Currently, LHMWD is receiving MWD funds through EMWD for ultra-low flush toilets and washing machines programs.

Conservation Pricing

EMWD has meters for each customer and charges a volumetric rate for water use. By charging each customer for the volume of water used, EMWD encourages customers to reduce water use and therefore the amount paid for water. This rate system meets the requirements of BMP 11.

Conservation Coordinator

BMP 12 concerns a conservation coordinator. EMWD does not have a dedicated conservation coordinator at this time. Instead, a team of three full-time and two part-time employees work together to coordinate conservation programs and BMP implementation, prepare and submit the Council BMP Implementation Report, and communicate and promote water conservation issues to senior staff.

Water Waste Prohibition

EMWD has an Ordinance that provides for special water conservation provisions. Ordinance 72.19 limits the use of potable water for golf courses and aesthetic impoundments. It also has several provisions for conservation ethics for all EMWD customers. Ordinance 72.19 meets the requirements of BMP 13.

Ultra-Low Flush Toilet Replacements

Ultra-low flush toilet replacement has occurred in EMWD since 1993. EMWD offers rebates with funding through MWD, and more than 15,742 toilets were replaced from 1993 to 2004 resulting in approximately 546.5 AF of water saved annually. Recent surveys have found that there is still a significant market for toilet replacement, and EMWD will continue to offer replacement toilets each year. This program meets the requirements of BMP 14.

Demand Management Measures (DMM)

The fourteen best management practices encouraged by CUWCC correspond to the fourteen demand management measures advocated by the State of California. EMWD's actions are detailed in the included CUWCC Reports and these reports meet the requirements set forth by law.

Evaluation of DMMs Not Implemented

EMWD has worked to implement each of the DMMS or BMPs. As detailed in the attached CUWCC reports, all of the DMMs are implemented, and in some cases EMWD has gone beyond the requirements of CUWCC and the Water Code.

Section 8 – Planned Water Supply, Projects and Programs

Proposed Supply Projects and Programs

As the population in EMWD's service area continues to increase, EMWD is planning for the future by aggressively pursuing the completion of new facilities and sources of supply. Not content to depend on MWD for potable water delivered to our boundary lines, EMWD's Capital Improvement Plan (CIP) includes projects for treating raw water and desalting groundwater. EMWD has also taken steps to increase the reliability and the output of the groundwater basins in a safe and responsible manor through integrated recharge and recovery. EMWD is also planning, or already in the process of, expanding each of its regional water reclamation facilities to treat the increased wastewater generated by the growing population thereby supplying additional recycled water. Table 8.1 shows the AFY each proposed project will supply, Table 8.2 gives the schedule for water supply expansion projects from EMWD's CIP.

Table 8.1 - Future Water Supply Projects -AFY

			Multiple Dry Years Supply		
Project Name	Normal Year Supply (AF)	Single Dry Year Supply (AF)	Year 1	Year 2	Year 3
Water					
Perris Desalter II	4,500	4,500	4,500	4,500	4,500
Hemet Microfiltration Plant	8,800	8,800	8,800	8,800	8,800
Perris Microfiltration Plant Expansion	8,800	8,800	8,800	8,800	8,800
IRRP Phase 1	7,500	7,500	7,500	7,500	7,500
IRRP Phase 2	15,000	15,000	15,000	15,000	15,000
Recycled Water					
San Jacinto Valley RWRF Expansion to 14 MGD	3,400	3,400	3,400	3,400	3,400
San Jacinto Valley RWRF Expansion to 18 MGD	4,500	4,500	4,500	4,500	4,500
Moreno Valley RWRF Expansion to 21 MGD	9,000	9,000	9,000	9,000	9,000
Temecula Valley RWRF Expansion to 18 MGD	6,700	6,700	6,700	6,700	6,700
Temecula Valley RWRF Expansion to 22 MGD	4,500	4,500	4,500	4,500	4,500
Perris Valley RWRF Expansion to 22 MGD	12,300	12,300	12,300	12,300	12,300
Perris Valley RWRF Expansion to 30 MGD	9,000	9,000	9,000	9,000	9,000

Table 8.2 - Water Supply Projects Timeline

Project Name	Projected Start Date	Projected Completion Date
Water		
Perris Desalter II	Aug. 2005	Sept. 2008
Hemet Microfiltration Plant	Jan. 2003	Aug. 2006
Perris Microfiltration Plant Expansion	Sept. 2003	Nov. 2006
IRRP PHASE 1	Jan. 2004	Sept. 2006
Recycled Water		
San Jacinto Valley RWRF Expansion to 14 MGD	Oct. 2004	Dec. 2011
San Jacinto Valley RWRF Expansion to 18 MGD	Nov. 2019	June 2024
Moreno Valley RWRF Expansion to 21 MGD	Nov. 2006	Nov. 2009
Temecula Valley RWRF Expansion to 18 MGD	Nov. 2002	June 2006
Temecula Valley RWRF Expansion to 22 MGD	Feb. 2010	March 2015
Perris Valley RWRF Expansion to 22 MGD	Jan. 2005	Feb 2013
Perris Valley RWRF Expansion to 30 MGD	Aug. 2014	Oct. 2018

Desalters

EMWD currently has one desalter producing potable water from high TDS groundwater threatening to contaminate the potions of the West San Jacinto area, and has finished construction and is preparing to begin production at a second desalter. The completion of a third desalter in 2006 will put EMWD at the sustainable capacity of groundwater desalination and supply an increased supply of 4,500 AFY. Currently, the Perris II Desalter is in design and completion is anticipated for April of 2006.

Because the groundwater levels in the basins that supply groundwater for the desalter are rising, a single or even multiple-dry year event would have insignificant effects on the desalter production. Production is projected to remain at the 4,500 AFY rate.

Hemet Microfiltration Plant

In the Hemet/San Jacinto area, the population has outgrown the ability of groundwater alone to meet demand. To offset that demand, EMWD is in the process of constructing a microfiltration plant that will treat unfiltered raw water from the State Water Project (SWP) for potable use in the area. This 8,800 AF plant will depend on MWD for a source of water to treat. MWD has assured its member agencies of its ability to meet demand even during multiple dry years through 2020 and therefore, the production rate of the microfiltration plant will be unaffected by dry weather patterns.

Perris Microfiltration Plant Expansion

Currently, the microfiltration plant in Perris is undergoing an expansion from a capacity of 8,800 AFY to 17,600 AFY. This expansion is expected to be completed in November of 2006. Like the Hemet plant, the Perris microfiltration plant is not dependent on weather patterns and will not be limited in dry years.

Integrated Recharge and Recovery Project

Currently, EMWD uses untreated water from MWD for groundwater recharge in the Hemet/San Jacinto area. To expand that effort and as part of the Hemet/San Jacinto Water Management Plan, EMWD is developing a program of replenishment and recovery that will be implemented in two phases. The first phase will result in the ability to recover 7,500 AFY of water from the basin by 2010. Work on the integrated replenishment and recovery program has been initiated. Since much of the recharge will take place within the San Jacinto River, EMWD is working with the Army Corps of Engineers to prepare an Environmental Impact Statement for the project.

Recycled Water

EMWD owns, operates and maintains four regional water reclamation facilities (RWRF) throughout the District. Each one of these plants will be expanded over the next twenty years to meet the demand of the increasing population. Although the treatment capacity of each plant will be increased, the supply of recycled water will only increase as the population grows. In addition, due to the fluctuation in demand for recycled water throughout the year and the year-round consistent supply of recycled water, there is more recycled water available in the winter than is needed. This leads to seasonal discharges. Therefore, in estimates of available water supply, only the treated recycled water available and used to meet demand is listed as a source of supply, and not the entire capacity of the treatment plants.

San Jacinto Valley Regional Water Reclamation Facility

The San Jacinto Valley RWRF is currently under design for an expansion from secondary to tertiary treatment. This expansion will allow the recycled water from this plant to be used for more purposes than secondary treated water. The expansion to tertiary treatment will be completed in spring of 2008. In addition to the current expansion, this plant will be expanded again to increase capacity to meet new demands. Outlined in EMWD's Year 2025 Regional Water Reclamation Facilities Capital Improvement Plan (RWRF-CIP) the first expansion will take the plan from 11 MGD of capacity to 14 MGD. This expansion should be completed in 2011. The next expansion will take the plant to 18 MGD capacity and will begin in 2020 and be completed by 2024.

Moreno Valley RWRF

In April of 2005, planning began for the expansion of the Moreno Valley RWRF. This plant will be expanded from 13 MGD capacity to 21 MGD by 2009 according to the RWRF-CIP.

Temecula Valley RWRF

Located in one of the most rapidly growing areas of EMWD, the Temecula Valley RWRF just completed an expansion in 2005 and has two more scheduled before 2020. The expansion from 12 to18 MGD is in construction and is scheduled to be complete in June of 2006, and the expansion to 22 MGD will begin in 2010 and be completed in 2018.

Perris Valley RWRF Expansion

The Perris Valley Expansion to 22 MGD is in final design and will be completed in 2007. This expansion will double the capacity of the current treatment facilities. Another expansion to 30 MGD is scheduled to begin in 2013 and be completed by 2019.

Section 9 – Desalinated Water

As discussed previously, EMWD's Groundwater Desalination Program will construct three desalters, providing up to 12,000 AFY of low salinity potable water. The first two desalters are on line, and the third desalter is in the preliminary design stage.

The single greatest impediment to expanding EMWD's desalination plan is the high cost of brine disposal. As an inland agency, EMWD must purchase brine disposal capacity in a regional disposal system operated by the Santa Ana Watershed Project Authority (SAWPA). The costs of brine disposal are increasing extremely rapidly, threatening the economic viability of EMWD's program. Additionally, recent increased interest in desalination by other agencies in the region has led to a shortfall in available capacity that will limit EMWD's ability to expand its program in the future.

Because of the increased costs and limited availability of brine disposal capacity in SAWPA's regional system, EMWD has initiated several research projects to evaluate the feasibility of reducing brine volumes, including a research proposal with the U.S. Bureau of Reclamation to examine "zero-liquid discharge."

If EMWD can develop a strategy to minimize brine volumes and reduce the cost of brine disposal, expanded desalination of recycled water will become feasible. EMWD has developed groundwater management plans which call for up to 20,000 AFY of groundwater recharge using imported State Water Project water purchased from MWD. This imported water could be replaced (up to 10,000 AFY) by desalted recycled water, improving overall supply reliability and reducing EMWD's dependence upon imported water.

EMWD's preliminary research and feasibility studies into brine volume reduction will be completed late in 2007.

Table 9.1 - Opportunities for Desalinated Water

Source	Yield AFY	Start Date	Type of Use
Recycled Water	10,000	Unknown	Groundwater Recharge

Section 10 – Wholesale Water

Bringing Imported Water to EMWD

The Metropolitan Water District of Southern California (MWD) is a public agency organized in 1928 by a vote of electorates of thirteen Southern California cities. The agency was created by the original Metropolitan Water District Act (Metropolitan Act) by the California Legislature "for the purpose of developing, storing, and distributing water" to the residents of Southern California.

The first function of MWD was to build the Colorado Aqueduct bringing Colorado River water to Southern California. As MWD was constructing the San Jacinto Tunnel Portion of the project, a great amount of seepage was encountered. As the seepage began to affect local water resources, residents began to organize to protect their water supply. About the same time, the region experienced years of dry weather and the underground basin began to experience overdraft. It became clear that a source of imported water was necessary. EMWD was formed in 1950 to bring imported water into the area. In 1951, it was annexed into MWD and the first major sale of Colorado River water within EMWD, began in July of 1952.

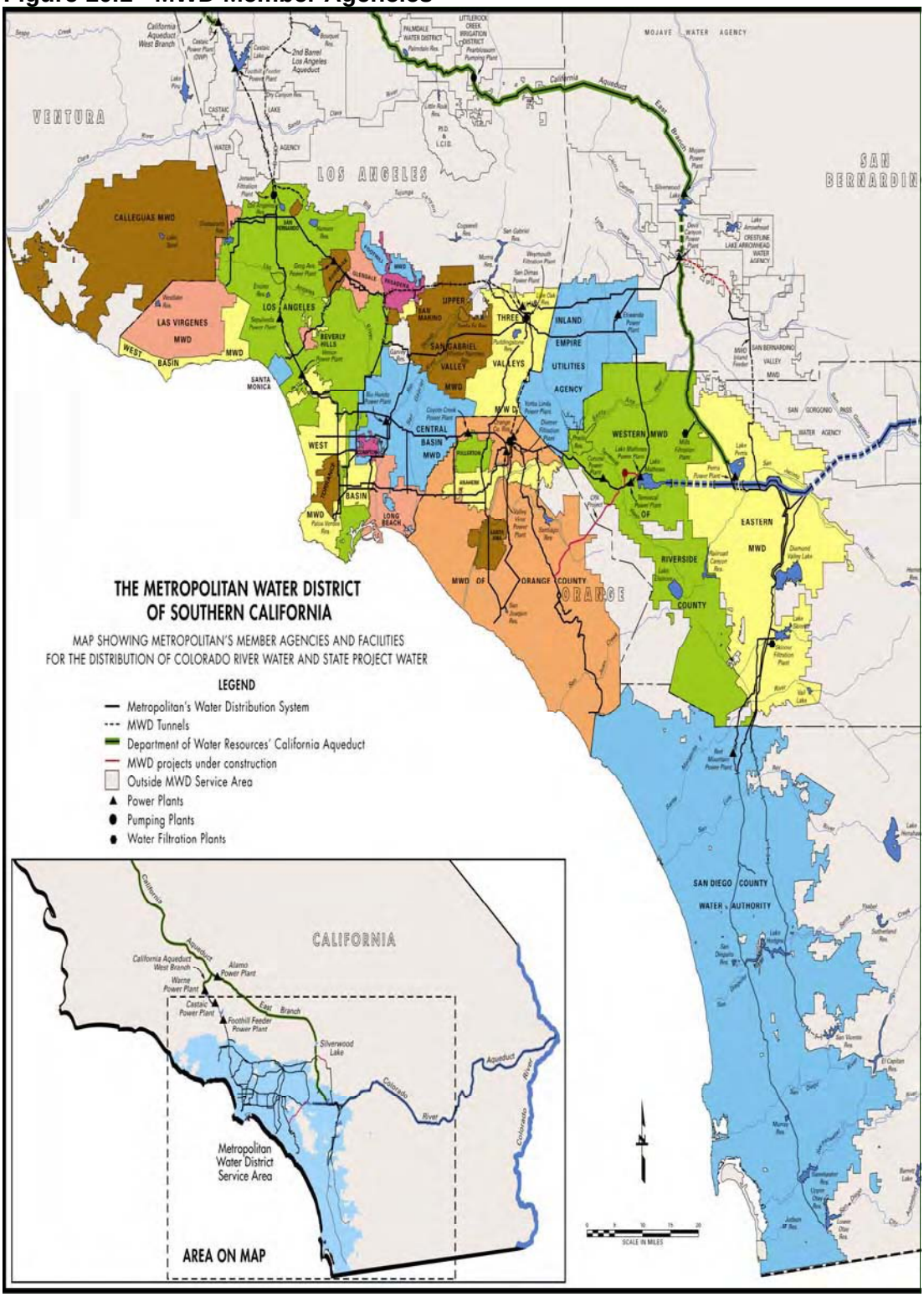
In 1960, MWD contracted for additional water supplies from the State Water Project (SWP) operated by the State of California Department of Water Resources (DWR). In 1972, the SWP began bringing water from the wet climate of northern California to the dry climate of southern California. Through the 1980's, EMWD built facilities to take advantage of the SWP water available, and today, 75% of EMWD's water supply is provided from Northern California.

Member Agencies

In addition to EMWD, MWD is composed of 25 other member agencies, including fourteen cities, ten other municipal water districts and one county water authority. MWD's service area includes the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the City of Oxnard in the north to the Mexican Border on the south, and it reaches more than 70 miles inland. The service area includes potions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Approximately 90% of the population within these counties is within MWD's boundaries. MWD member agencies serve more than 143 cities and 89 unincorporated areas. Figure 10.1 shows a map of MWD's service area.

Member agencies receive deliveries at different points in the system and pay for the service through a rate structure made up of multiple components. Each year member agencies advise MWD how much water they anticipate they will need during the next five years. MWD also works with member agencies to develop a forecast of future water demand.

Figure 10.1 - MWD Member Agencies



MWD is a wholesale provider only, and has no retail customers. It provides treated and untreated water directly to its member agencies. The 26 member agencies then deliver to their customers a blend of groundwater, surface water, desalinated water, recycled water and imported water from MWD. MWD has provided between 45% and 60% of the municipal and agricultural water used in its nearly 5,200-square mile service area. The remaining water is provided through local resources and imported water from other sources. More information about MWD is summarized in Section I.2 of the RUWMP.

Board of Directors

MWD's Board of Directors consists of thirty-seven directors. Each member agency is allotted at least one director with each agencies assessed value determining it's additional representation and voting rights. Currently, EMWD Board of Director's President, Randy Record, represents EMWD on MWD's Board.

Planning for the Future

MWD takes a comprehensive and proactive approach to planning for the future. Through coordination with member agencies, MWD has developed regional targets to accommodate growth and face the challenges to supply reliability. Through the past decade, MWD has undertaken several planning initiatives including the Integrated Resources Plan (IRP), the Water Surplus and Drought Management Plan (WSDMP), and the Strategic Plan and Rate Structure. Together these programs and plans provide a framework and guidelines for the future. Section II of the provides aditional information about MWD's planning efforts.

Integrated Resources Plan

In the 1990's, several years of drought and regulations requirements began to affect the reliability of MWD water supply. In response to this challenge, MWD and its member agencies began an Integrated Resource Plan (IRP) process level of supply reliability needed and to find a cost-effective way to meet the goals establish. The IRP was a collective effort drawing input from several groups including MWD's Board of Directors, an IRP workgroup (comprised of MWD staff, member agency and sub agency managers, as well as groundwater basin managers), and representatives from the environmental, agricultural, business and civic communities. It was important that the IRP process was collaborative because its viability was contingent on the success of local projects and local plans in achieving their individual target goals for resource management and development.

The outcome of the IRP process was a "Preferred Resource Mix" which would ensure MWD and its member agencies reliability through 2020. The MWD Board of Directors adopted the first IRP in January of 1996. In November of 2001, the MWD Board of Directors adopted a plan to update the IRP. The update focused on changed conditions, updated resource targets, and extending the planning horizon to 2025 and beyond. Again the process was a collaborative effort. The 2003 IRP Update was adopted in July of 2004

MWD's resource mix depends on a blend of improving the reliability and availability of imported water supplies into the region, increasing local storage and developing local resources. The 2003 IRP update demonstrated that MWD and its member agencies

have moved the region toward the goal of long-term water reliability. Major achievements have been made in:

- Conservation
- Water recycling and groundwater recovery
- Storage and groundwater management programs within the Southern California region
- Storage programs related to the SWP and the Colorado River
- Other water supply management programs outside of the region.

The 2003 IRP Update includes information about programs and resources developed or identified as part of the IRP process. Below is a table from the update summarizing each program and its status.

Table 10.1 – IRP Targets

Target	Programs and Status
• Conservation	Current – Conservation Credits – 1992 Plumbing Code – Southern California Heritage Landscape Program * In Development or Identified – Innovative Conservation Program – Innovative Supply Program
• Recycling • GW Recovery • Desalination	Current – LRP Program In Development or Identified – Additional LRP Requests or Proposal – Seawater Desalination Program
• SWP	Current – SWP Deliveries – San Luis Carryover Storage (Monterey Agreement) – Environmental Water Account In Development or Identified – Sacramento Valley Water Management Agreement – CALFED Delta Improvement Program
• CRA	Current – Base Apportionment – IID/MWD Conservation Program – Coachella and All American Canal Lining Program (to SDWCA & San Luis Rey) – Hayfield Storage Program** – PVID Land Management Program In Development or Identified – Lower Coachella Storage Program – Chuckwalla Storage Program – Central Arizona Banking Program – QSA Programs & Interim Surplus Guidelines
• In Region Dry-Year Storage	Current – Diamond Valley Lake, Lake Matthews, Lake Skinner – SWP Terminal Reservoirs (Monterey Agreement)
• In Region Groundwater Conjunctive Use	Current – North Las Posas – Cyclic Storage – Replenishment Deliveries

	– Proposition 13 Programs (short-listed) In Development or Identified – Raymond Basin GSP – Proposition 13 Programs (wait-listed) – Expanding existing programs – New groundwater storage programs
Target	Programs and Status
• CVP/SWP Storage and Transfers • Spot Transfers and Options	Current – Arvin Edison Program – Semi-tropic Program – San Bernardino Valley MWD Program – Kern Delta Program – Desert Water/Coachella Valley Advanced Storage – Spot Market transfers and options – Mojave Storage Demonstration Program (pilot) In Development or Identified – San Bernardino Valley MWD Conjunctive Use Program – Kern Water Banking Program – Other San Joaquin Valley Programs

* Program savings not currently quantified

** Program has been implemented with approximately 72,000 AF in storage and extraction facilities are under construction.

Through the development and expansion of these programs, MWD has been able to insure reliable water deliveries through 2025. The 2003 IRP Update is available through MWD or on its website.

Water Surplus and Drought Management Plan

In order to insure that water needs will be met during years of drought, surplus water must be managed during years of surplus. To accomplish this task, MWD developed the Water Surplus and Drought Management Plan (WSDM). Adopted in April of 1999, this plan provides policy guidance for management of regional water to achieve the reliability goal of the IRP. The guiding principle of the WSDM plan is to "Manage Metropolitan's water resources and management programs to maximize adverse impacts of water shortage to retail customers." Should mandatory import water allocations be necessary, those allocations would be calculated based on need, as opposed to any type of historical purchases.

MWD has several stages from surplus to shortage and a planned response for each stage. The following section discusses the management activities to be taken, depending on the level of available supplies, starting with a large amount of surplus to extreme shortage. Under MWD's current IRP, the measures listed for extreme shortage should not have to be implemented for the next 20 years.

Surplus Stages

Surplus Stage 5 - MWD makes deliveries to all available in-region and out of region storage resources.

Surplus Stage 4 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs.

Surplus Stage 3 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; and deliveries to Semi tropic and Arvin-Edison groundwater storage programs.

Surplus Stage 2 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; deliveries to Semi tropic and Arvin-Edison groundwater storage programs and deliveries of SWP carryover water to SWP reservoirs.

Surplus Stage 1 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; deliveries to Semi tropic and Arvin-Edison groundwater storage programs; deliveries of SWP carryover water to SWP reservoirs and contractual groundwater storage deliveries.

Shortage Stages

Shortage Stage 1 - MWD may make withdraws from Diamond Valley Lake.

Shortage Stage 2 - MWD will continue Shortage Stage 1 action and may draw from out-of-region groundwater storage.

Shortage Stage 3 - MWD will continue Shortage Stage 2 actions and may curtail or temporarily suspend deliveries to Long-term Seasonal and Replenishment programs in accordance with discount rates.

Shortage Stage 4 - MWD will continue Shortage Stage 3 actions and may draw from conjunctive use groundwater storage and the SWP terminal reservoirs.

Severe Shortage Stages

Shortage Stage 5 – MWD will continue Shortage Stage 4 actions. MWD's Board of Directors may call for extraordinary conservation, may curtail Interim Agricultural Water Program Deliveries.

Shortage Stage 6 - MWD will continue Shortage Stage 5 actions and may exercise any and all water supply option contracts and/or buy water on the open market for consumptive use or for delivery to regional storage facilities for use.

Section II.4 of the RUWMP has additional information about the WSDM Plan.

EMWD Demand

MWD does not provide supply projections for each member agency. Instead MWD uses a regional approach to developing projections. MWD calculates the demand for the entire region as discussed in Appendix A.1 of the RUWMP and then using information about existing and proposed local projects, determines the amount of imported water. Through out 2005, EMWD has provided to MWD information about local supply and projects, clarification on boundary information and population projects. Based on this information and information provided by other member agencies, MWD feels it is able to meet the demands of all member agencies through 2030. Table 10.2 shows the projected water information provided to MWD by EMWD in August of 2005. The demand

estimated for MWD is slightly higher than the final projections shown in Sections 2 and 6. The final projections were refined after this earlier estimation.

Table 10.2 EMWD Imported Water Demand -AFY

	2005	2010	2015	2020	2025	2030
Water for Direct Consumption (Raw and Potable)	86,630	91,300	106,500	123,900	137,000	147,500
Replenishment Water	8,000	20,000	22,200	22,600	22,600	22,500

Section 11 – Water Shortage Contingency Plan

The mission of EMWD is to provide safe and reliable water and wastewater management services to its community in an economical, efficient, and responsible manner now and in the future. Part of accomplishing that mission is to plan for the unplanned. EMWD has two tools that assist in that planning 1) the Water Shortage Contingency Plan (WSCP), included in Appendix D, and 2) the Water System Emergency Operation Procedures (WSEOP). The WSCP will guide EMWD in advising and enforcing conservation during times of water shortage, while the WSEOP is an operational guide created to avert water shortages in the EMWD service area during emergency conditions.

Stages of Action

The WSCP for EMWD was adopted in July of 2005. This plan limits water demand during times of shortage in four stages. These stages can be triggered when there is water deficiency caused by limitations on supply or limitations on EMWD's delivery system. The plan shall be implemented in case of a long or short-term water deficiency, or in case of an emergency water shortage. The stages are summarized in the table below:

Table 11.1 -Water Shortage Contingency Plan Stages of Action

Stage No.	Water Supply Conditions	% Shortage
1	Anticipated or existing water demand exceeds available supply due to any of the following: – Shortfall at MWD's water treatment plants (Skinner or Mills) – Reduction in availability of MWD's raw water supply – Shortfall at EMWD microfiltration plants or desalination plants – Reduction in availability of water from EMWD wells. – Limitations on delivery system	**5-10**
2		**10–20**
3		**25-50**
4		**>50**

When implementation of the plan is triggered by anticipated limitations in supply or delivery, the Board of Directors, at the request of the General Manager, has the ability to implement appropriate water shortage contingency measures to limit the impact on EMWD customers as much as possible. When a water shortage emergency occurs, the General Manager has the authority to implement the plan if necessary.

Estimate of Minimum Supply

Metropolitan Water District of Southern California (MWD) has multiple sources of water supply. Most of them are imported, some of them are local and some of them are both (imported water treated locally). As EMWD's mission is to provide safe and reliable water, EMWD strives to ensure that customer demand can be met in all circumstances. Even under the driest three-year cycle, EMWD supply is anticipated to meet demand. With the groundwater management plans in place, the West San Jacinto area has rising water levels and wells are not anticipated to decrease production, and the Hemet/San Jacinto area will be recharged in years of surplus to prepare or recover from dry years. Since local water supplies are stable and fixed, the small increase in demand during dry years will be met through imported water form MWD. Under the Integrated Resources Plan (IRP) and Water Surplus and Drought Management Plan (WSDM) water, imported

by MWD, will be available to meet 100% of member agencies' demands even during dry periods. Therefore, as seen in the table below, the available supply will be determined by the amount of water required to meet demands. In the event the next three years are not dry, surplus water supplies will be stored for future use under the guidelines the WSDM plan provides.

Table 11.2 - Three- Year Estimated Dry Year Supply AFY
(1990-1992 Hydrology)

	2006	2007	2008
Current Supplies			
Local Water Sources			
Groundwater-Hemet/San Jacinto Basin Native Groundwater	11,040	10,080	9,120
Groundwater – West San Jacinto	6,000	6,000	6,000
Groundwater Desalter – Menifee	2,000	3,000	3,000
Groundwater Desalter – Perris	2,000	4,500	4,500
Recycled Water – M&I Use	4,383	5,232	6,080
Recycled Water – Agricultural Use	22,814	21,978	21,142
Imported Water Sources			
Perris FP	8,800	8,800	8,800
Mills and Skinner	75,033	73,938	69,043
MWD Untreated AG	2,504	2,208	1,912
Supplies Under Development			
Local Water Sources			
Groundwater Desalter – Perris II	0	0	0
Recycled Water – Industrial Enterprise and Aesthetic Improvement	1,414	2,828	4,242
Hemet/San Jacinto Watermaster	2,800	3,500	4,200
Imported Water Sources			
Hemet FP – MWD Raw Water Treated by EMWD			4,400
Perris FP Expansion – MWD Raw Water Treated by EMWD			2,900
Recharge Water into the San Jacinto Basin	8,496	11,372	14,248
Total	147,284	153,436	159,587
% of Normal	100%	100%	101%

Catastrophic Supply Interruption

EMWD is dependent on MWD for the majority of its supply. As described in section 11.5 of the RUWMP, MWD has prepared for emergencies through storage, facility design and redundant power sources. Half of the capacity of Diamond Valley Lake, located within EMWD's service area, is reserved for emergency supply. Diamond Valley Lake Reservoir is designed to gravity feed in the case of an electrical failure. In addition to Diamond Valley Lake, MWD has other storage programs that are detailed in Appendix A.3-3 of the RUWMP. For treatment plants MWD has back up generators in place in case of electrical outage.

To protect EMWD customers in the case of an emergency, EMWD has developed the Water Shortage Emergency Operations Plan (WSEOP). This plan determines the operation response to any emergency. An emergency is defined as any time MWD or EMWD facilities are incapable of supplying potable water. An emergency could be caused by a natural disaster such as an earthquake or through facility failures. The operational describes the coordination required between operational staff, management, community involvement staff and other EMWD employees. In addition communication and cooperation will be required with the community and other agency such as the Department of Health Services and MWD. In the event that one or more water supply

source is unavailable, remaining sources of supply will be maximized to meet demand. If needed the WSCP could be implemented to conserve water and reduce demand. If an electrical or gas power outage occurs, some of EMWD's booster facilities have back up generators. Facilities without redundant power sources may be served on a priority basis by portable generator.

Prohibition, Penalties and Consumption Reduction Methods

In order to reduce demand by EMWD customers in the case of deficiency in water supply, EMWD has developed several prohibitions and consumptive reduction methods. These methods are targeting outdoor water use, and under the most extreme deficiencies would reduce demand more than 50%.

The WSCP prohibitions and reduction methods are organized by customer groups with different limitations on each group. Stage 1 starts with voluntary measures. In the past, voluntary conservation that is the result of intense public relations costs has led to a 10% reduction in demand. As the water deficiency increases, measures become mandatory and will lead to the needed reduction in water demand. The tables below list limitations placed on customers in the event the WSCP is implemented.

Table 11.3 - Prohibitions

Prohibitions	Stage When Prohibition is Implemented
Do not hose down driveways or any other hard surfaces except for health or sanitary reasons. Use a broom or blower instead.	Voluntary Stage 1 Mandatory Stage 2
Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve.	Voluntary Stage 1 Mandatory Stage 2
No replacement water will be provided for ponds, lakes, etc.	Mandatory Stage 2
Washing of autos, trucks, trailers, motor homes, boats, airplanes or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables.	Mandatory Stage 3
No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.	Mandatory Stage 4
No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.	Mandatory Stage 4
No new lawns/turf, whether by seed or sod, shall be permitted.	Mandatory Stage 4
No person or entity shall be required to implement any new landscaping requirements of any association, developer or governing agency until the termination of Stage 4.	Mandatory Stage 4
Based on interruptible agriculture water from MWD, field and row crops may be discontinued.	Mandatory Stage 4

Table 11.4 - Consumption Reduction Methods

Consumption Reduction Method	Projected Reduction	Stage When Consumption Reduction Method is Implemented
Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering).	5% of external use	Voluntary Stage 1 Mandatory Stage 2
Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.	10% of external use	Voluntary Stage 1 Mandatory Stage 2
Where possible, install pool and spa covers to minimize water loss due to evaporation.	90% of water loss in pools	Voluntary Stage 1 Mandatory Stage 2
Refrain from using decorative fountains unless they are equipped with a recycling system.		Voluntary Stage 1 Mandatory Stage 2
Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.	Varies	Mandatory Stage 3
The use of water from fire hydrants shall be limited to fire fighting and related activities.	Varies	Mandatory Stage 3
Water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.	Varies	Mandatory Stage 3
Outdoor irrigation by sprinklers will only be allowed every other day.	50% of external use	Mandatory Stage 3
Irrigation of landscaping is only allowed twice per week with hand-held hose only.	72% of external use	Mandatory Stage 4
All new landscaping shall be limited to drought-tolerant plantings as determined by the District.	30% of eternal use for all new homes	Mandatory Stage 4
Use of water by all types of commercial car washes shall be reduced in volume by 50%.	50%	Mandatory Stage 4
Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100% of ET) to 0.8 (80% of ET).	20%	Voluntary Stage 1 Mandatory Stage 2
Landscape meters to 75% of ET	25%	Mandatory Stage 3
Landscape meters to 60% of ET	40%	Mandatory Stage 4

The WSCP gives EMWD the right to impose penalties for the unreasonable use or waste of water while the plan is in effect. It also allows EMWD to impose fines for individual events violating the plan, or to impose a tiered rate system that will provide for charges and/or penalties for higher consumption of water over and above the requirements for Stages 1 through 4 of the plan. The event based penalties and charges are detailed in Table 11.5.

All of EMWD's customers are metered with meters usually read once a month. If the WSCP is implemented, EMWD could monitor water use for comparison with historical data to determine water savings. EMWD could also use meter readers to report violation of the WSCP or excessive water use.

Table 11.5 - Penalties and Charges

Penalty and Charges	Stage When Penalty Takes Effect
For the first monthly violation of the provisions of the water shortage contingency plan, the District shall issue a written notice of fact of such violation to the customer.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
For the second and third month violations, a surcharge of 100% of current charges.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
For the fourth and succeeding month(s) violation, a surcharge of 200% of current water bill commodity charge shall be added to the customer's water bill.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
Thereafter, the District may install a flow restricting device of one gallon per minute (1 GPM) capacity for services up to 1 ½" size and comparatively sized restrictors for larger services.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
The District may also terminate a customer's irrigation/landscape meter service.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.

Analysis of Revenue

As a result of a water shortage or emergency situation, there may be a reduction of revenue from water sales. To protect EMWD from financial hardship in such a situation, a financial reserve account has been established to meet the fixed cost associated with water delivery that may not be met in the case of reduced water sales. In the tables below, the revenue impacts of implementing the WSCP are analyzed.

Table 11.6 - Actions and Conditions that Impact Revenue

Type	Anticipated Revenue Reduction
Reduced Water Sales	Water sales are approximately 40% of EMWD's annual revenue. A reduction in the demand of water by 50% would also mean a reduction in revenue from water sales of 50% leaving a shortfall of approximately 20% of EMWD annual revenue.

Table 11.7 - Actions and Conditions that Impact Expenditures

Category	Anticipated Cost
Increased Staff Cost	Staff costs for implementing the WSCP could vary depending on the stage trigger by a deficiency in water supply. Stage 1 and 2 would probably be implemented with only current staff members. Stage 3 or 4 of the plan may require additional staff to implement. The amount and level of staff will vary greatly depending on the public's response to the plan.
O & M Cost	Operations and maintenance cost may be minimally impacted by the implementation of the WSCP, but these costs are projected to have minimal impact on EMWD's total revenue.
Cost of Supply and Treatment	Cost of supply would decrease due to a decrease in demand and would offset some of the costs associated with reduced water sales.
Public Outreach Costs	Costs associated with informing the public about implementing the WSCP will vary based on the public's response and the stage of the plan implemented.

Table 11.8 - Proposed Measures to Overcome Revenue Impacts and Increased Expenditures

Name of Measure	Summary of Effect
Rate Adjustment	Part of the WSCP is the ability to implement a tiered rate. This may offset some of the lost revenue due to a decrease in water sales.
Reserve Policy	EMWD, as a matter of policy, keeps a reserve of funds equivalent to 90 days of operational expenses. This reserve fund could be used to mitigate revenue shortfalls.
Rate Stabilization Fund	EMWD also has a rate stabilization fund with approximately $7 million available to offset increased costs and decreased sales.

Section 12 - Water Recycling

Planning Coordination

As a full-spectrum provider of water, wastewater collection, and treatment and recycled water services, EMWD has been active in developing local and regional plans for expanded water recycling in its service area. EMWD's first Recycled Water Facilities Master Plan was developed in 1990 and formally updated in 1997. EMWD's local water recycling plan is also incorporated into the Integrated Regional Water Management Plan developed by the Santa Ana Watershed Planning Authority for the San Jacinto and Santa Ana Watersheds.

The District has worked closely with the Santa Ana Regional Water Quality Control Board in updating local basin plans and developing a long-term salinity management plan to support and ensure compliance with local basin objectives for salinity and nitrogen. EMWD is also participating in the development of a Total Maximum Daily Load (TMDL) analysis for impacted surface waters in the Santa Ana Watershed.

EMWD has been involved with a variety of local agencies and public interest groups in recycled water planning efforts:

Table 12.1 – Participating Agencies

Group/Agency	Role
1) Santa Ana Watershed Planning Authority	Regional Cooperative Planning
2) Santa Ana Regional Water Quality Control Board	Basin Planning/Salinity Mgmt
3) Rancho California Water District	Facility Planning/Market Dev.
4) West San Jacinto Groundwater Management Plan Advisory Board	Plan Review/Public Oversight
5) Hemet/San Jacinto Groundwater Management Plan Policy Committee (Cities of Hemet, and San Jacinto and Lake Hemet Municipal Water District)	Plan Review/Public Oversight
6) Elsinore Valley Municipal Water District	Facility Planning/Market Dev.
7) EMWD Recycled Water Adv. Comm.	Plan Review/public Oversight
8) San Jacinto Watershed Council	Plan Review/Public Oversight
9) Lake Elsinore/San Jacinto Watershed Authority	Plan Review/Water Quality
10) Metropolitan Water District of Southern California	Regional Urban Water Mgmt. Planning

Wastewater Quantity, Quality and Current Uses

The District is responsible for all wastewater collection and treatment in its service area. Wastewater collection and treatment facilities include:

- 1,534 miles of gravity sewer
- 53 sewage lift stations
- 5 regional water reclamation facilities (RWRF)

Inter-connections between the local collections systems serving each treatment plant allow for operational flexibility, improved reliability, and expanded deliveries of recycled water.

Table 12.2 - EMWD Treatment Facilities – AFY

Treatment Plant	Level of Treatment	Capacity	*2000* Flow	*Current* Flow
San Jacinto Val. RWRF	Secondary	12,300	7,800	9,400
Moreno Valley RWRF	Tertiary	17,900	12,200	14,200
Perris Valley RWRF	Tertiary	12,300	8,600	12,200
Sun City RWRF	Tertiary	3,400	Not in Service	Not in Service
Temecula Valley RWRF	Tertiary	15,700	8,500	14,200
Total System		61,600	37,100	50,000

With the exception of the San Jacinto Valley RWRF, all of EMWD's RWRF's produce tertiary effluent, suitable for all Department of Health Services permitted uses, including irrigation of food crops and full-body contact. The secondary effluent produced by the San Jacinto Valley RWRF is used locally for the irrigation of fodder, feed, and seed crops. However, tertiary treatment capacity will be added to the plant in 2006.

EMWD's recycled water delivery system includes:

- 135 miles of large diameter transmission pipeline,
- 6,000 AF of surface storage reservoirs (10 separate sites),
- 4 regional pumping plants.

EMWD currently has 91 recycled water customers and sells up to 26,000 AFY of recycled water. The majority of recycled water sold is used for agricultural irrigation. However, sales to municipal customers are increasing rapidly as residential and urban development replaces irrigated farmland. EMWD also sells recycled water to the California Department of Fish and Game for habitat creation and environmental enhancement at the San Jacinto Wildlife Area.

EMWD is able to sell 90% - 100% of the recycled water produced by its treatment plants during the peak demand months (June – September). During the cooler, wetter parts of the year, surplus recycled water is stored in unlined surface impoundments, resulting in extensive groundwater recharge. If storage capacity is full, surplus recycled water is disposed through a regional outfall pipeline to Temescal Creek and the Santa Ana River.

Table 12.3 - Wastewater Collected and Treated – AFY

	2000	2005	2010	2015	2020	2025
Wastewater Collected & Treated	36,572	49,976	61,051	69,817	78,177	85,785
Quantity Meeting Recycling Standards	36,572	49,976	61,051	69,817	78,177	85,785

Table 12.4 - Disposal of Wastewater (Non-Recycled) – AFY

Name of Disposal	Treatment	2000	2005	2010	2015	2000	2025
Livestream Discharge	Tertiary	0	9,976	13,651	18,117	22,977	26,785

Table 12.5 - Recycled Water Uses – Projected AFY

Type of Use	Treatment Level	2005 AFY
Agriculture	Secondary/Tertiary	17,037
Landscape	Tertiary	3,500
Wildlife Habitat	Secondary/Tertiary	2,000
Wetlands/Lake	Tertiary	2,463
Industrial	Tertiary	0
Groundwater Recharge *	Secondary/Tertiary	15,000
Total		40,000

* Note – From a regulatory viewpoint, this recharge is permitted as being incidental to storage.

Potential and Projected Use, Optimization Plan with Incentives

As mentioned previously, EMWD's extensive water recycling distribution system will maintain the current high level of operation as agricultural customers are replaced by municipal customers. EMWD is planning additional pipelines that will expand municipal use of recycled water over time and is planning several innovative projects to provide recycled water to long-term agricultural customers (citrus orchards) in-lieu of over drafted groundwater. The District will maintain current levels of groundwater recharge to sustain project yields for the Perris Basin Desalination Program, and will work with the California Department of Fish and Game to expand the use of recycled water at the San Jacinto Wildlife Area.

Table 12.6 - Recycled Water Use Potential - AFY

Type of Use	Treatment Level	2010	2015	2020	2025
Agriculture	Tertiary	13,400	13,200	13,200	13,200
Landscape	Tertiary	7,700	10,950	13,200	15,750
Wildlife Habitat	Tertiary	4,300	4,300	4,300	4,300
Wetlands/Lakes/Supply Augmentation	Tertiary	2,000	3,250	4,500	5,750
Industrial	Tertiary	5,000	5,000	5000	5,000
Groundwater Recharge	Tertiary	15,000	15,000	15,000	15,000
Total		47,400	51,700	55,200	59,000

EMWD is committed to maximizing recycled water uses wherever possible. Within the framework of known and potential projects, Table 12.7 lists potential recycled water use also includes projections for future recycled water use.

EMWD's year 2000 projection for recycled water use in 2005 was based upon the following assumptions:

- Continued strong agricultural sales
- Rapid expansion of municipal markets
- Stable habitat sales
- Expanded sales to Elsinore Valley Municipal Water District

A comparison of projected reclaimed water use versus actual sales for 2005 shows that the projections were fairly accurate.

Table 12.7 - Recycled Water Use – 2000 Projection Compared to 2005 Actual-AFY

Type of Use	2000 Projections for 2005	2005 Actual Use
Agriculture	19,495	17,037
Landscape	10,680	3,500
Wildlife Habitat	2,213	2,180
Wetlands/Lake Supply Augmentation	2,000	2,463
Industrial	0	0
Groundwater Recharge	8,726	15,118
Total	43,114	40,298

Due to land use changes and wet winter conditions, 2005 agricultural sales were lower than projected. Municipal sales were lower than projected due to operational issues, which limited the connection of new customers in portions of EMWD's service area. These problems have been corrected and growth in municipal sales should increase sharply over the next five years.

Methods to Encourage Recycled Water Use

EMWD uses a variety of methods to expand the use of recycled water within its service area. These methods include:

Mandatory Recycled Water Use Ordinance – The District has adopted an ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available. This ordinance provides a basis for denying potable water service to customers refusing to utilize available recycled water for permitted uses.

Rate Incentives – Tertiary recycled water is currently priced at approximately one third of the cost of potable water for municipal use and at one quarter of the cost of potable agricultural deliveries for crop-irrigation.

Water Supply Assessments – EMWD's SB 610 and 221 Water Supply Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted.

Public Education – EMWD actively promotes the public use of recycled water in several elements of its water education program. EMWD also places prominent signage at public recycled water use sites promoting the benefits of water recycling.

Market Surveys – EMWD periodically hires market firms to survey businesses in its service area in order to identify potential recycled water customers.

Facilities Financing – EMWD will work with private parties to arrange or provide financing for construction of facilities needed to convert existing customers from potable water to recycled water.

EMWD does not have any data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for agricultural customers to use recycled water in-lieu of groundwater. However, as municipal customers continue to replace agriculture, it is reasonable to assume that the mandatory provisions of the District's Recycled Water Use Ordinance will play a major role in program expansion.

Section 13 - Water Quality Reliability

Water quality is large part of EMWD's strategic goal to "Provide a safe and reliable supply of water at a reasonable cost." Planning and monitoring for water quality are important for protecting public health, controlling costs and insuring reliability for the future. EMWD has identified eleven contaminants that do not currently meet public health guidelines and several other concerns that may limit EMWD supplies in the future. Tables 13.1 and 13.2 list these areas of concern and give information about each one.

In addition to EMWD's concerns, MWD has identified several areas of regional concern in the 2005 MWD Regional Urban Water Management Plan. Although MWD anticipates no significant reduction in water supply reliability for the next 20 years, water quality affecting local water supplies may increase demand on MWD's water supply beyond what had been projected.

Public Heath Goals

A Public Health Goal (PHG) is the level of a contaminant in drinking water, which there is no known or expected risk to health. The California Office of Environmental Health Hazard Assessment (OEHHA) based these goals on the best available toxicological data in the scientific literature. These are goals and not regulations.

The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs as is economically and technologically feasible. If MCLs are lowered for the eleven contaminants listed in Table 13.1, further treatment or blending may be required. If the MCL cannot be met using blending or treatment, a portion of EMWD's water supply may be unavailable.

Other Concerns

Table 13.2-3.4 lists future regulations that may affect EMWD's water supply and the risk it may pose to EMWD's water supply reliability. These are regulations that will be in place or may be in place in the future.

MWD Water Quality

As part of the Integrated Resource Plan, MWD has concentrated on maintaining the quality of source water and developing management programs that protect and enhance water quality. MWD has two water supply sources and each one has water quality issues. To date, MWD has not identified any water quality issues that cannot be mitigated. Salinity may decrease the amount of water available if membrane treatment is required. MWD could experience a loss of up to 15 percent of the water processed. Since only a small portion of the total water supply would be treated and blended with the remaining unprocessed water, there is no significant risk to MWD's water supply availability. Additional information and analysis of water quality is included in Section IV of the RUWMP.

Table 13.1 – EMWD Present PHG Violations

Contaminant	Bromate	Chromium	Coliform	Copper
Year(s)	2003	1998-2000	2001-2003	2002-2003
Units	Ug/L	ug/L	monthly percent	ug/L
PHG (MCLG)	(0)	2.5	(0)	170
MCL	10	50	5	AL = 1300
Source	Mills	Well 44 Well 56 Well 57	Distribution system samples	Distribution system samples
% of Potable Water Supply in 2005	54.0%	0.7% 0.1% 1.1%	Unknown	Unknown
Range	4.5 - 10.4	1.1-10	0 - 2.1	90th % = 230
Range Category of risk to public health	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)	Unknown: coliforms are not harmful in of themselves, but an indicator of poor water quality	Acute Toxicity (Gastrointestinal effects in children, Human data)
Cancer Risk @ PHG or MCLG	0	1×10^{-6}	NA	NA
Best Available Treatment	Optimize Ozone treatment	Reverse Osmosis	Optimize chlorine residuals, programs for flushing, cross connections, monitoring,	Optimize Corrosion Control
Cost estimate per 1000 gallons (in dollars)*	NA		NA	0.008
Action taken by EMWD	EMWD supports MWD to optimize the Ozone treatment at the Mills Plant.	These wells blend in the distribution system, and no chromium has been detected downstream.	EMWD has programs for flushing, cross connection, extensive monitoring for coliform, chlorine residuals and HPCs. EMWD also works toward the optimal use of chlorine to reduce the formation of disinfection by products.	East Valley has 48% of Cu problem, EMWD is looking into altering addition of polyphosphates for Fe and Mn sequestration to enhance corrosion control.

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Dibro-mochloro-propane (DBCP)	Lead	Nickel			Nitrate
Year(s)	2001-2002	2002-2003	2003			2001-2003
Units	ng/L (ppt)	Ug/L	ug/L			mg/L
PHG (MCLG)	1.7	2	12			10
MCL	200	AL = 15	100			10
Source	Well 44	Distribution system samples	Well 11	Well 34	Well 56	Well 44**
			Well 28	Well 35	Well 76	Well 49**
			Well 33	Well 55		

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Dibro-mochloro-propane (DBCP)	Lead	Nickel			Nitrate
Percent of Potable Water Supply in 2005	0.7%	Unknown	0.0%	0.4%	0.8%	0.7%
			1.0%	1.6%	1.7%	0.3%
			0.9%	0.7%		
Range	ND - 70	90th percentile = 7	48	38	62	12.9 - 16
			11-14	20	16 - 88	21 - 24
			40	53		
Range Category of risk to public health	Carcinogenicity (Cancer)	Chronic Toxicity (Neurobehavioral effects in children, Hypertension in adults) and Carcinogenicity (Cancer)	Developmental Toxicity (Increased Neonatal Deaths)			Acute Toxicity (Methemoglobinemia)
Cancer Risk @ PHG or MCLG	1×10^{-6}	NA	NA			NA
Best Available Treatment	Granular Activated Carbon	Optimize Corrosion Control	Ion Exchange, Lime softening, Reverse Osmosis			Blending, Ion Exchange, Reverse Osmosis, Electrodialysis
Cost estimate per 1000 gallons (in dollars)*	0.43	Unknown	0.43 - 0.56			0
Action taken by EMWD	EMWD blends at this well to reduce nitrates, therefore the actual numbers at POE are less, although not less than the PHG. No further action has been taken.	Continue to investigate corrosion control in system.	None			EMWD blends at these wells to reduce nitrates to less than MCL

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)	Uranium
Year(s)	2001-2003	2001-2003	2001-2003
Units	ug/L	ug/L	pCi/L
PHG (MCLG)	0.06	0.8	0.5
MCL	5	5	20
Source	Well 44 Well 49	Well 56	Skinner San Jacinto West Portal Well 75
Percent of Potable Water Supply in 2005	0.7% 0.3%	0.8%	17.4% 0.2%
Range	1.4 - 1.5 2.5 - 2.7	0.5 - 1.9	ND – 3.18 ND - 3.92 8.96

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)	Uranium
Range Category of risk to public health	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)
Cancer Risk @ PHG or MCLG	1×10^{-6}	1×10^{-6}	1×10^{-6}
Best Available Treatment	Granular Activated Carbon, Packed Tower Aeration	Granular Activated Carbon, Packed Tower Aeration	Ion Exchange, Enhanced coagulation/ filtration, Lime softening, RO
Cost estimate per 1000 gallons (in dollars)*	0.43	0.43	0.43 - 0.56
Action taken by EMWD	EMWD blends at these wells to reduce nitrates, therefore the actual numbers at POE are less. No further action has been taken.	None	Skinner plant uses enhanced coagulation/filtration, Well 75 feeds the Menifee Desalter using RO. Water from the San Jacinto Portal is treated at the Perris WFP by ultrafiltration.

Table 13.2 – EMWD Potential PHG & MCL Violations

Constituent	Arsenic	Groundwater Rule
Year(s) sampled	2004	
Units	ug/L	
PHG (MCLG)	NA	
MCL	10	
Source	Well 17	all EMWD wells are absent for E. coli
Percent of Potable Water Supply in 2005	0.7%	17.4%
Range	5-10	
Risk to public health	Cancer risk	
Status of Constituent or Rule	Arsenic Rule is promulgated and will start in June, 2005	Groundwater Rule due by end of 2005: fecal contamination
Risk to EMWD water supply	May lose this source if arsenic rises to >10 ug/L unless EMWD treats at the wellhead.	Low level of risk, if contamination is found, EMWD will have to prove 4 log virus inactivation.

Table 13.3 – EMWD Potential PHG & MCL Violations, UCMR

Constituent	Perchlorate	Radon	1,2,3-TCP, Trichloro-propane	Chromium VI	CCL microbes
Year(s) sampled	2004	2002-03 2002 2002 2002 2003	2003	2003	Adenovirus, Aeromonas hydrophila, Calciviridae, Coxsackievirus, Cyannobacteria, Echovirus, Helicobacter pylori, Microsporidia, Mycobacterium avium Complex
Units	ug/L	pCi/L	ug/L	ug/L	
PHG (MCLG)	6	>300 proposed	NL= 0.005 ug/L		
MCL	NA		NA		
Source	Well 44 Well 49 Well 57	Well 44 Well 49 Well 56 Well 57 Well 76	Well 23	Well 35	Unknown levels in wells
Percent of Potable Water Supply in 2005	0.7% 0.3% 1.4%	0.7% 0.3% 0.8% 1.4% 1.7%	0.0%	1.6%	17.4%
Range	ND-5 9.6-11 ND	1250-1440 606 778-914 918-1090 361	0.053	1.5	
Risk to public health	Possible endocrine disruptor	cancer risk	cancer risk	Cancer risk	Gastrointestinal disease, meningitis, Hand, foot and mouth disease, conjunctivitis, unspecified febrile illness, dermatitis, hepatitis, respiratory illness, peptic ulcer, gastric cancer, wasting syndrome
Status of Constituent or Rule	PHG promulgated in 2004, MCL is pending	Radon Rule is pending	No action at this time, future regulation possible	No action at this time, future regulation possible, needs a PHG to determine MCL which was due in 2004	No action at this time, future regulation possible
Risk to EMWD water supply	Low risk, since these three wells are already treated for nitrates by blending	Rule is pending, no PHG or MCL has been established	Well 23 is off line due to other water quality and operational problems	Level of 1.5 ug/L is very low, probably not going to be regulated at this level.	Unknown

Table 13.4 – EMWD Potential PHG & MCL Violations, Contaminant Candidate List (CCL) Chemicals

Constituent	Fluoride	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)
Year(s) sampled	2004	2004	2004
Units	mg/L	ug/L	ug/L
PHG (MCLG)	2	0.06	0.8
MCL	1	5	5
Source	All EMWD wells and surface waters are <= 0.7 mg/L	Well 44 Well 49	Well 56
Percent of Potable Water Supply in 2005		0.8% 0.3%	0.8%
Range		1.2-2 3.6-7.9	1.5-1.7
Risk to public health	fluoridosis	cancer risk	cancer risk
Status of Constituent or Rule	On CCL, EPA will request NAS to update the Risk Assessment	On CCL, EPA has requested NAS to update the Risk Assessment	On CCL, EPA has requested NAS to update the Risk Assessment
Risk to EMWD water supply	Probably a low risk, since all of our waters are below the recommended level of fluoride to prevent dental caries.	These wells are already blended to treat nitrate, however the blended waters are still above the PHG. EPA will continue to reassess this chemical until the PHG equals the MCL. If this happens, treatment will be required.	EPA will continue to reassess this chemical until the PHG equals the MCL. If this happens, treatment will be required.

Colorado River

The most serious threat to the Colorado River supplies is salinity levels. Colorado River supplies must be blended with State Water Project (SWP) water to meet the adopted salinity standards. MWD is working to reduce current salinity level and protect salinity levels from rising in the Colorado River. In addition, MWD is also working to protect the Colorado River from uranium, perchlorate and hexavalent chromium. MWD fully expects its source protection efforts to be successful. Therefore, the only water quality constraint on the use of Colorado River Water is salinity levels.

State Water Project

The water quality issues on the SWP include total organic carbon, bromides and salinity. MWD is working to protect the water quality of this source, but has also seen the need for upgraded treatment to deal adequately with water quality concerns. Total organic carbon and bromide levels are producing disinfection byproducts that current water treatment plants may be inadequate to deal with. MWD expects this treatment limitation to be overcome over the next few years by implementing ozone as the primary

disinfectant, and does not expect water quality to limit SWP supplies over the RUWMP study period.

Regional Water Quality

New standards for contaminants may add cost to the use of groundwater storage and may affect reliability of local agency groundwater sources. These standards are not expected to effect MWD's water supply, but may increase dependence on MWD. MWD has not analyzed the effect local water quality issues may have on total supply reliability.

The major water quality concerns MWD has identified for the region are:

- Salinity
- Perchlorate
- Total Organic Carbon and Bromide
- Methyl Teriary Butyl Ether (MTBE) and Tertiary Butanol (TBA) in groundwater and local surface reservoirs
- Arsenic
- Radon
- Uranium
- N-nitrsodimethylamine (NDMA) in groundwater and treated surface waters
- Hexavalent chromium in groundwater
- Pharmaceuticals and personal care products

Salinity

High salinity can reduce operational flexibility and increase the cost of water. Membrane treatment can result in water losses of up to 15 percent of the treated water. High total dissolved solids (TDS) in water also leads to high TDS in wastewater and therefore, recycled water, limiting the use of recycled water. Imported water with high salinity could also limit use of local groundwater basins for storage because of water quality standards set for the basin. For all of these reasons, MWD's Board of Directors approved a Salinity Management Policy that set a specified salinity objective and identified the need to manage both imported and local water sources comprehensively.

For EMWD, salinity management is part of groundwater management. Included in efforts to control salinity in the groundwater basins used to supply water, is the construction of EMWD's desalination plants. Other efforts to control or reduce salinity levels included monitoring of recharge source water salinity levels and recycled water use in the basins. At this time, EMWD does not expect salinity levels to reduce local water source reliability, and the desalination efforts will actually improve and protect the quality of the groundwater.

Perchlorate

Ammonium perchlorate has also been identified as a regional water quality concern. Perchlorate has been found in MWD's Colorado River water supply, and has contaminated groundwater basins, limiting local supply. In response to concerns over perchlorate in drinking water, MWD adopted a Perchlorate Action Plan in 2002. Today,

the concentrations of perchlorate in Colorado River Water are less than California's detection limit.

Assessing the impact of perchlorate in local groundwater basins is part of the Perchlorate Action Plan. Total well production lost to well closures because of perchlorate is 57,000 AFY. Although treatment is available for perchlorate, it can be costly. Local agencies may not pursue treatment because of cost considerations.

EMWD had detected perchlorate in three potable production wells located adjacent to the March Air Reserve Base. Positive test values range from 5-11 ug/L. Regulatory agencies have not characterized a perchlorate plume associated with EMWD wells. These wells also show elevated levels of nitrate and trace levels of Dichlorobromophenol (DCB), a nematocide. These contaminants likely result from past agricultural use of the surrounding properties. The combined output of these wells is approximately 2.4% of EMWD's total water supply. Production from the wells is blended with imported water from MWD Mills Filtration Plant under permit by the State Department of Health Services. Treatment is not required, and monitoring indicates no increase in contaminant levels over time.

Total Organic Carbon and Bromide

When source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or chloramines, disinfection byproducts (DBP) form. In studies, DBPs have been linked to cancer and chlorinated water has been associated with reproductive and developmental effects. In 1998, the Environmental Protection Agency adopted more stringent regulations for DBPs and is expected to promulgate even more stringent requirements in the near future.

The existing levels of TOC and bromide in SWP water present concerns for MWD's ability to maintain safe drinking water supplies. Although CALFED has adopted water quality goals for TOC and bromide and called for a wide arrangement of actions to improve SWP water quality, MWD would like CALFED to adopt more stringent water quality improvement milestones.

In addition to efforts to protect source water, MWD has committed to installing ozone treatment systems in each of MWD's treatment plants by 2011. Currently TOC levels can be managed by blending.

EMWD has treated 100% SWP water at the existing microfiltration plant in Perris. Since conventional methods to treat water were not used, instead, membrane technology was employed. DBP's were not over the limit. It is anticipated that the proposed plant at Hemet/San Jacinto will see similar results. Therefore, DBP's are not anticipated to be a threat to EMWD's water supply.

Methyl Tertiary Butyl Ether and Tertiary Butanol

Until recently, Methyl Tertiary Butyl Ether (MTBE) was the primary oxygenate in nearly all of the gasoline used in California. MTBE, used to reduce air pollution, has caused a serious water contaminant. MTBE is very soluble in water and has a low affinity for soil particles allowing the chemical to move quickly in groundwater. MTBE is also resistant to chemical and microbial degradation, making contamination treatment difficult.

MWD monitors its water supply for MTBE and other oxygenates contamination regularly. MTBE testing results have ranged from non-detectable to 3.9 ug/L, below the primary PHG of 12 ug/L. At Diamond Valley Lake and Lake Skinner, MWD has limited recreational use to reduce the potential for MTBE.
MTBE presents a problem to local groundwater basins. A gallon of gasoline (11% MTBE by volume) can contaminate 16.5 million gallons of water at 5 ug/L. Within MWD's service area, local groundwater producers have been forced to close some wells. Although improved underground storage requirements and monitoring and the phasing out of MTBE as a fuel additive, which should decrease the contamination of groundwater, it is difficult to determine how large the MTBE problem may be. Treatment methods have been found to reduce contaminant levels 80 to 90 percent, but increasing the use of imported water may prove to be more cost effective to some agencies.

EMWD has not found MTBE or TBA contamination in any local sources of water.

Arsenic

The new federal MCL for arsenic in domestic water supplies is 10 ug/L with an effective date of 2006. MWD water supplies have low levels of arsenic and will not require treatment to comply with this new standard. However, some member agencies may face greater problems with arsenic compliance. The cost of arsenic removal may cause some member agencies to increase use of imported water.

EMWD has a well that has arsenic detected in it, and may exceed the arsenic regulations and have to be taken out of service if treatment is not put in place at the wellhead.

Radon

The United States Environmental Agency has proposed a radon MCL of 300 pCi/L. MWD's water supplies have a radon level less than the proposed level, but some sub agencies may need to treat local water sources. Since there is a cost-effective method of treating radon, water supply reliability may not be affected by radon regulations.

EMWD has five wells that violate the 300 pCi/L levels for radon and may require further treatment.

Uranium

There is a 10.5 million ton pile of uranium mine tailings at Moab, Utah that lies 600 feet from the Colorado River. Rainwater has seeped through the pile and contaminated the local groundwater, causing contaminants to flow into the river. There is also a threat that million of tons of material containing uranium will be washed into the Colorado River by a flood. Currently, operations and maintenance activities include intercepting some of the groundwater before it discharges into the river, and the Department of Energy has agreed to move the tailings. Remediating the site will require Congressional appropriations, and maintaining Congressional support for a cleanup will require close coordination and cooperation with other Colorado River users.

Uranium levels in at MWD's intake range from 1 to 5 pCi/L, below the California drinking water standard which is 20 pCi/L. EMWD has found levels close to 9 pCi/L at Well 75 that will be treated with reverse osmosis at the Menifee Desalter.

N-nitrosodimethylamine

N-nitrosodimethylamine (NDMA) is a by-product of water and wastewater treatment and has been detected in MWD's water supply system. MWD's RUWMP states that some NDMA control measures, or removal may be required to avoid impacting Southern California's water supply.
NDMA has not been detected in EMWD's local water sources.

Hexavalent Chromium

Hexavalent Chromium or Chromium VI is a possible contaminant in groundwater and surface water. Chromium VI enters water sources through industrial discharges, leaching form hazardous waste sites and erosion of natural deposits. The California OEHHA is currently reviewing a maximum contaminant level for total chromium and has not determined a MCL for Chromium VI.

There are no proven technologies for reducing Chromium VI in water supplies to low levels. However, the American Water Works Association Research Foundation has initiated a research program in Chromium VI removal.

EMWD has very low levels of Chromium VI detected in one well.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products are a source of concern in both source and recycled water. Monitoring and treatment of these contaminants would have an unknown effect on the cost of water and wastewater treatment. It is difficult to predict the effect pharmaceuticals and personal care products will have on water supply reliability based on the limited information available.

MWD's RUWMP

Additional information on water quality issues and concerns and mitigation efforts can be found in MWD's RUWMP in Section IV..

Section 14 - Water Service Reliability - Normal Water Year

As discussed previously in this report, EMWD has the supply needed to meet the demand of its customers through 2030. This conclusion is based on the assurances of MWD that it will be able to supply member agency demands, the reliability of local groundwater supplies achieved through groundwater management plans and the development of recycled water resources. Tables 14.1 through 14.3 compare the water supply and demand for normal water years through 2030.

Tables 14.1 through 14.3

Table 14.1 – Projected Normal Water Year Supply – AFY

	2010	2015	2020	2025	2030
Supply	168,800	195,000	215,800	231,900	245,200
% of Normal Year	100%	100%	100%	100%	100%

Table 14.2 – Projected Normal Water Year Demand – AFY

	2010	2015	2020	2025	2030
Demand	168,800	195,000	215,800	231,900	245,200
% of Normal Year	100%	100%	100%	100%	100%

Table 14.3 – Projected Normal Water Year Supply and Demand Comparison - AFY

	2010	2015	2020	2025	2030
Supply Total	168,800	195,000	215,800	231,900	245,200
Demand Total	168,800	195,000	215,800	231,900	245,200
Difference	0	0	0	0	0
Difference % of Supply	0%	0%	0%	0%	0%
Difference % of Demand	0%	0%	0%	0%	0%

Section 15 - Water Service Reliability - Single Dry Water Year

In addition to meeting the demand for a normal dry year, the law requires that water suppliers meet the need of its customers during a single dry year. For EMWD, meeting the small increase in demand due to a dry winter is accomplished through increasing imports from MWD and utilizing groundwater production. MWD assures its member agencies that, even in dry years, their needs will be met. The groundwater management plans assure that water recharged into the basins in wet years will be available in dry years. Tables 15.1 through 15.3 compare the water supply and demand for single dry water years through 2030.

Tables 15.1 through 15.3

Table 15.1 – Projected Single Dry Water Year Supply – AFY

	2010	2015	2020	2025	2030
Supply	171,900	198,400	219,400	235,800	249,200
% of Normal Year	102%	102%	102%	102%	102%

Table 15.2 – Projected Single Dry Water Year Demand – AFY

	2010	2015	2020	2025	2030
Demand	171,900	198,400	219,400	235,800	249,200
% of Normal Year	100%	100%	100%	100%	100%

Table 15.3 – Projected Single Dry Water Year Supply and Demand Comparison – AFY

	2010	2015	2020	2025	2030
Supply Total	171,900	198,400	219,400	235,800	249,200
Demand Total	171,900	198,400	219,400	235,800	249,200
Difference	0	0	0	0	0
Difference % of Supply	0%	0%	0%	0%	0%
Difference % of Demand	0%	0%	0%	0%	0%

Section 16 - Water Service Reliability - Multiple Dry Water Years

In the case of multiple dry years, resource planning by EMWD and MWD insures that consumer demands for water will be met. Since local resources are stable during a multiple dry year event and MWD resources are affected by weather fluctuations, the 1990-1992 hydrology was considered. These are the dry years considered by MWD in planning for the worst case multiple dry year scenarios.

Tables 16.1 through 16.3 compare the water supply and demand for multiple dry years ending in 2010.

Tables 16.1 through 16.3

Table 16.1 – Projected Supply During a Multiple Dry Year Period Year Ending in 2010 - AFY

	2006	2007	2008	2009	2010
Supply	147,200	153,400	159,600	165,700	171,900
% of Normal Year	102%	102%	102%	102%	102%

Table 16.2 – Projected Demand During a Multiple Dry Year Period Year Ending in 2010 – AFY

	2006	2007	2008	2009	2010
Demand	147,200	153,400	159,600	165,700	171,900
% of Normal Year	102%	101%	101%	101%	101%

Table 16.3 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2010 – AFY

	2006	2007	2008	2009	2010
Supply Total	147,200	153,400	159,600	165,700	171,900
Demand Total	147,200	153,400	159,600	165,700	171,900
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.4 through 16.6 compare the water supply and demand for multiple dry years ending in 2015.

Tables 16.4 through 16.6

Table 16.4 – Projected Supply During a Multiple Dry Year Period Year Ending in 2015 - AFY

	2011	2012	2013	2014	2015
Supply	211,000	215,200	219,400	222,700	226,000
% of Normal Year	102%	102%	102%	102%	102%

Table 16.5 – Projected Demand During a Multiple Dry Year Period Year Ending in 2015 – AFY

	2011	2012	2013	2014	2015
Demand	177,200	182,500	187,800	193,100	198,400
% of Normal Year	102%	101%	101%	101%	101%

Table 16.6 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2015 – AFY

	2011	2012	2013	2014	2015
Supply Total	211,000	215,200	219,400	222,700	226,000
Demand Total	177,200	182,500	187,800	193,100	198,400
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.7 through 16.9 compare the water supply and demand for multiple dry years ending in 2020.

Tables 16.7 through 16.9

Table 16.7 – Projected Supply During a Multiple Dry Year Period Year Ending in 2020 - AFY

	2016	2017	2018	2019	2020
Supply	20,600	206,800	211,000	215,200	219,400
% of Normal Year	102%	102%	102%	102%	102%

Table 16.8 – Projected Demand During a Multiple Dry Year Period Year Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Demand	20,260	20,600	211,000	215,200	219,400
% of Normal Year	102%	101%	101%	101%	101%

Table 16.9 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Supply Total	202,600	206,800	211,000	215,200	219,400
Demand Total	202,600	206,800	211,000	215,200	219,400
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.10 through 16.12 compare the water supply and demand for multiple dry years ending in 2025.

Tables 16.10 through 16.12

Table 16.10 – Projected Supply During a Multiple Dry Year Period Year Ending in 2025 - AFY

	2021	2022	2023	2024	2025
Supply	222,700	226,000	229,200	232,500	235,800
% of Normal Year	102%	102%	102%	102%	102%

Table 16.11 – Projected Demand During a Multiple Dry Year Period Year Ending in 2025 – AFY

	2021	2022	2023	2024	2025
Demand	222,700	226,000	229,200	232,500	235,800
% of Normal Year	102%	101%	101%	101%	101%

Table 16.12 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2025 – AFY

	2021	2022	2023	2024	2025
Supply Total	222,700	226,000	229,200	232,500	235,800
Demand Total	222,700	226,000	229,200	232,500	235,800
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.13 through 16.15 compare the water supply and demand for multiple dry years ending in 2030.

Tables 16.13 through 16.15

Table 16.13 – Projected Supply During a Multiple Dry Year Period Year Ending in 2030 - AFY

	2026	2027	2028	2029	2030
Supply	238,400	241,100	243,800	246,500	249,200
% of Normal Year	0%	101%	101%	101%	101%

Table 16.14 – Projected Demand During a Multiple Dry Year Period Year Ending in 2030 – AFY

	2026	2027	2028	2029	2030
Demand	238,400	241,100	243,800	246,500	249,200
% of Normal Year	0%	101%	101%	101%	101%

Table 16.15 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2030 – AFY

	2026	2027	2028	2029	2030
Supply Total	238,400	241,100	243,800	246,500	249,200
Demand Total	238,400	241,100	243,800	246,500	249,200
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

With the assurance of MWD and the reliability of EMWD's groundwater and recycled water, EMWD is confident of its ability to meet demand through 2030.